

RAILROAD GAZETTE

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TWENTIETH YEAR.

A Journal of Transportation, Engineering and Railroad News.

\$4.20 PER ANNUM.
POSTAGE FREE.

NEW YORK: 73 Broadway.

FRIDAY, APRIL 6, 1877.

CHICAGO: 77 Jackson St.

JUST PUBLISHED: RAILWAY DISBURSEMENTS And the Accounts into which they are Naturally Divided.

BY MARSHALL M. KIRKMAN.
Embracing carefully worded instructions in the form of
condensed rules for the government of the various officials
and agents in reporting to the accounting officer; the
expenses disbursed in operations; the labor performed by
operatives; and the money expended on account of the
company, and including copies of all the important blank
forms required by employees in sending the return re-
quested of them. The accounts have the great merit of sim-
plicity, of directness and of comprehensiveness, and are
especially important merit for practical
utility upon a road only a few miles in length, or one ex-
tending uninterruptedly across the continent.

The most complete and exact rules for keeping railroad
accounts ever published. Price \$2, postage paid. Pub-
lished by the RAILROAD GAZETTE, 73 Broadway, New
York.

GEORGE A. EVANS,
Bethlehem Steel Rails,
74 Wall Street, N. Y.

RAILWAY SAFETY APPLIANCES.

INTER-LOCKING SYSTEM.

CAUTION.

Whereas, in the year 1856, Letters Patent were
granted in England to John Saxy for his original
invention of Locking Apparatus to prevent acci-
dents at Junctions; and whereas the said John
Saxy, together with John Stinson Farmer, trading
under the style or firm of Saxy & Farmer, as
Railway Signalling Engineers and Manufacturers,
in London, England, are the sole proprietors of the
said patent, as well as of several other English
patents subsequently granted to them for improve-
ments; and whereas they were the first to intro-
duce the inter-locking system in America, and are
now the sole proprietors of three several United
States Patents granted to them for such improve-
ments, as well as of a patent granted to John Im-
sey for further improvements; which patents are
of number and date as follows, viz.:

United States Patent No. 80,878 Oct. 11, 1868,
" 131,788 October 1, 1872,
" 132,416 " 22, 1872
" 169,811 Nov. 9, 1875, and

whereas of late various Signalling Apparatus have
been advertised or made, which are infringements
of the above or of some or one of the above-men-
tioned United States Patents.

All persons and companies are hereby cautioned
against making, vending, or using any such Signal-
ling Apparatus which are infringements of the
fore-mentioned patents or some or one of them; and
notice is hereby given that they will be held re-
sponsible for any such infringements.

SAXBY & FARMER,
Railway Signalling Engineers.
London, N. W.

RAILROAD GAZETTE DIRECTORY.
[This index to the advertisements in the RAIL-
ROAD GAZETTE is published in order that they
may be more convenient and valuable to those
who make use of them as a directory of railroad
supplies and equipment. A number of adver-
tisements appear only "every other week" or
"once a month;" in such cases, where the adver-
tisement is not in the current number, a blank
appears instead of the folio opposite the name.]

Accountants:
Calhoun & Steele, 20 Nassau street, N. Y. 1
Air Brake:
Wm. Loughridge, Baltimore. 1
Axes:
Lake Erie Iron Co., Cleveland. 1
A. & P. Roberts & Co., Philadelphia. 1
Bolton Walker & Co., Pittsburgh. 1
Bolter Punches:
I. P. Richards, Providence, R. I. 1
Bolts, Nuts, Bolts, Boiler Rivets, etc.:
House & Townsend, Philadelphia. 1
Bridges:
American Bridge Co., Chicago. 1
Baltimore Bridge Co., Baltimore. 1
Cincinnati Bridge Co., Cincinnati. 1
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provided.

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Dickens Mfg. Co., Scranton, Pa. vii

Hinkley Locomotive Works, Boston. viii

Hinchliffe Loco. Works, Worcester, N. H. viii

Macomach Co., Taunton, Mass. viii

National Loco. Works, Connellsville, Pa. viii

Pittsburgh Loco. & Car Works, Pittsburgh. viii

Porter, Bell & Co., Pittsburgh. viii

Rogers Loco. & Machine Works, Paterson, N. J. viii

Schenectady Loco. Works, Schenectady, N. Y. viii

Taunton Loco. Mfg. Co., Taunton, Mass. viii

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Philadelphia, Wilmington & Baltimore. viii

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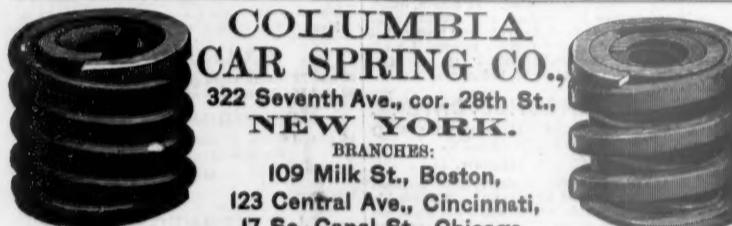
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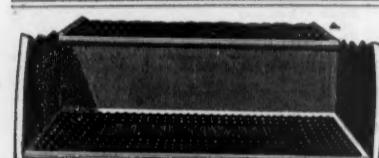
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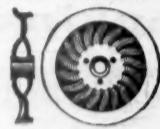
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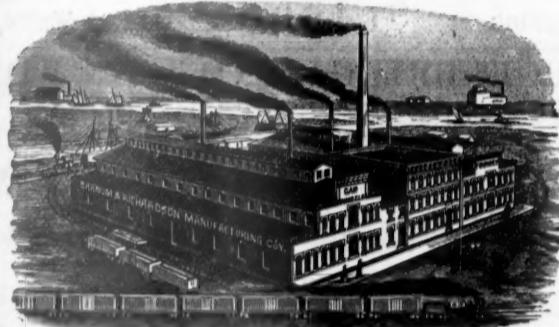
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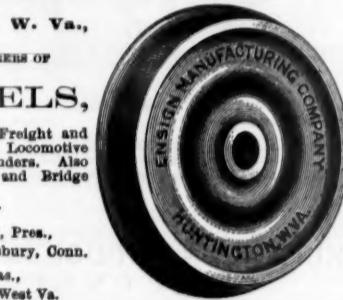
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MANUFACTURERS OF

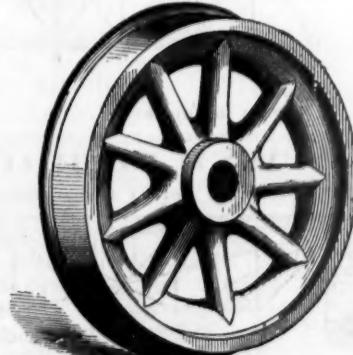
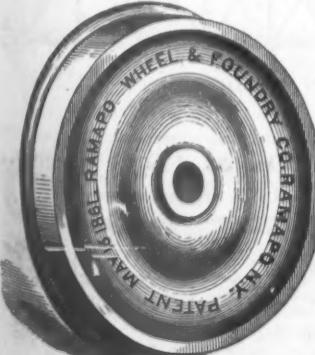
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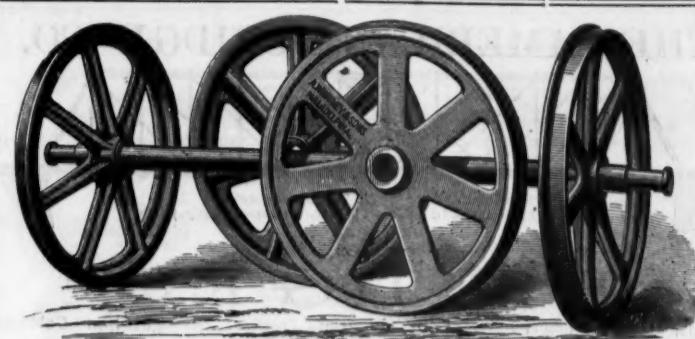


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With or without Axles.

WHEELS OF ALL PATTERNS

Made to Order and in Stock

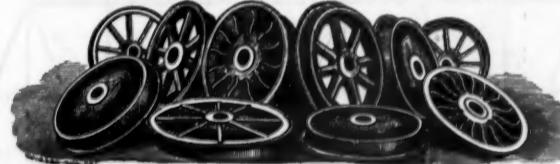
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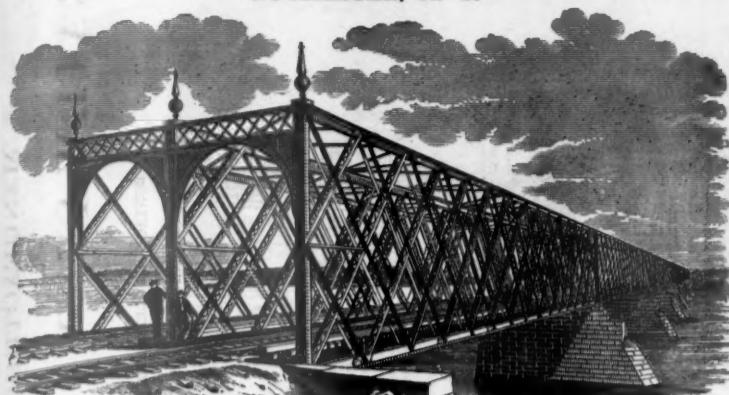
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WM. BRITTON, Secretary. | | Engineers.

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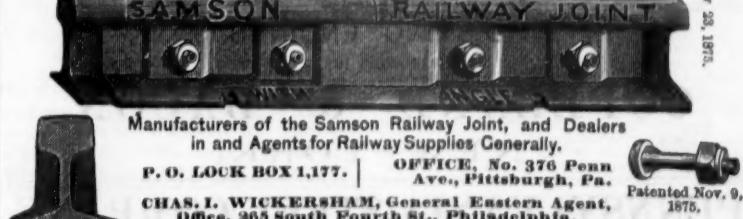
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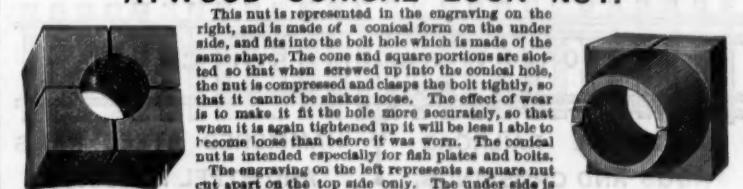
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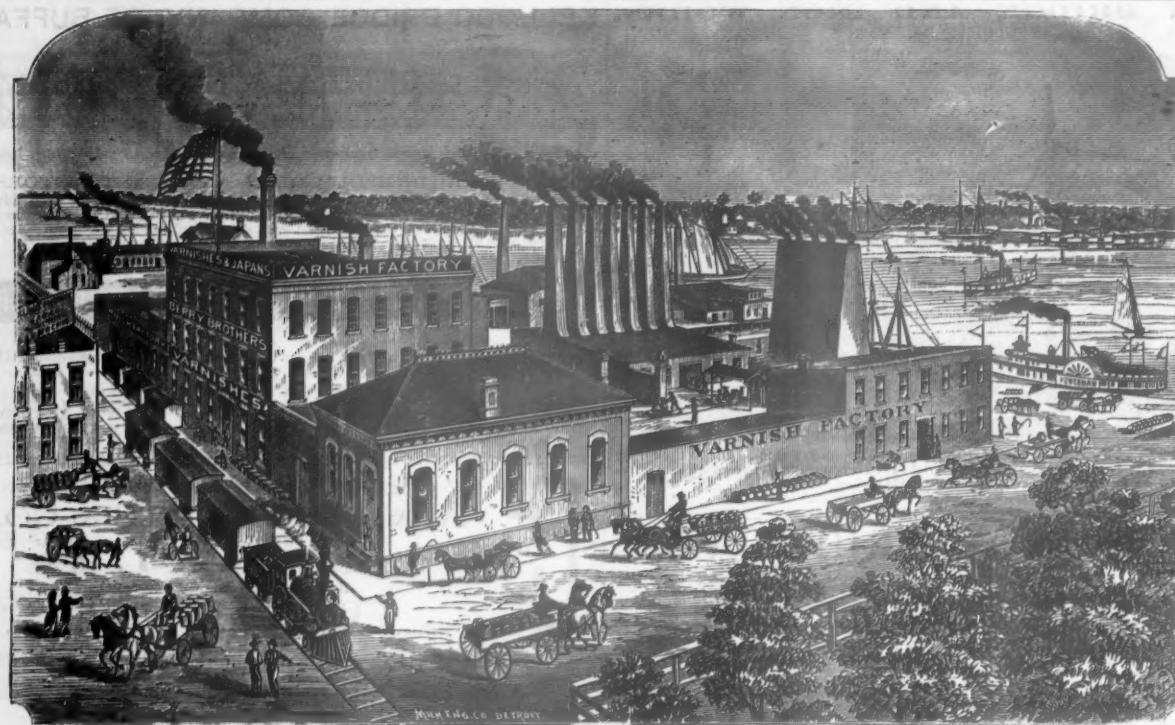
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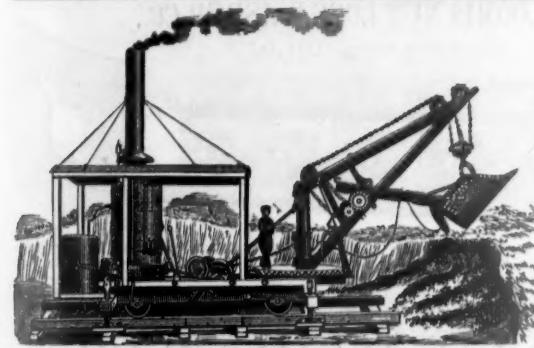
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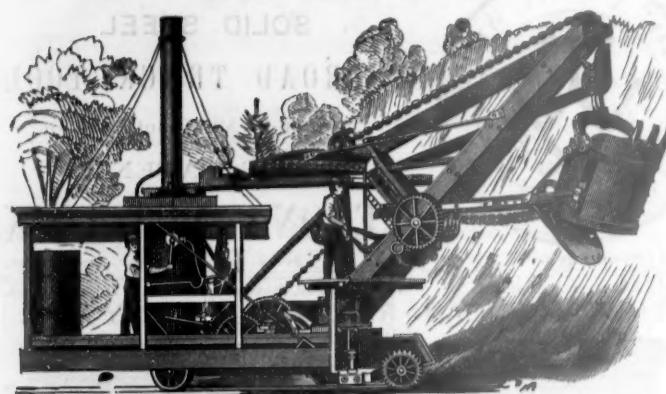
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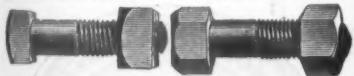
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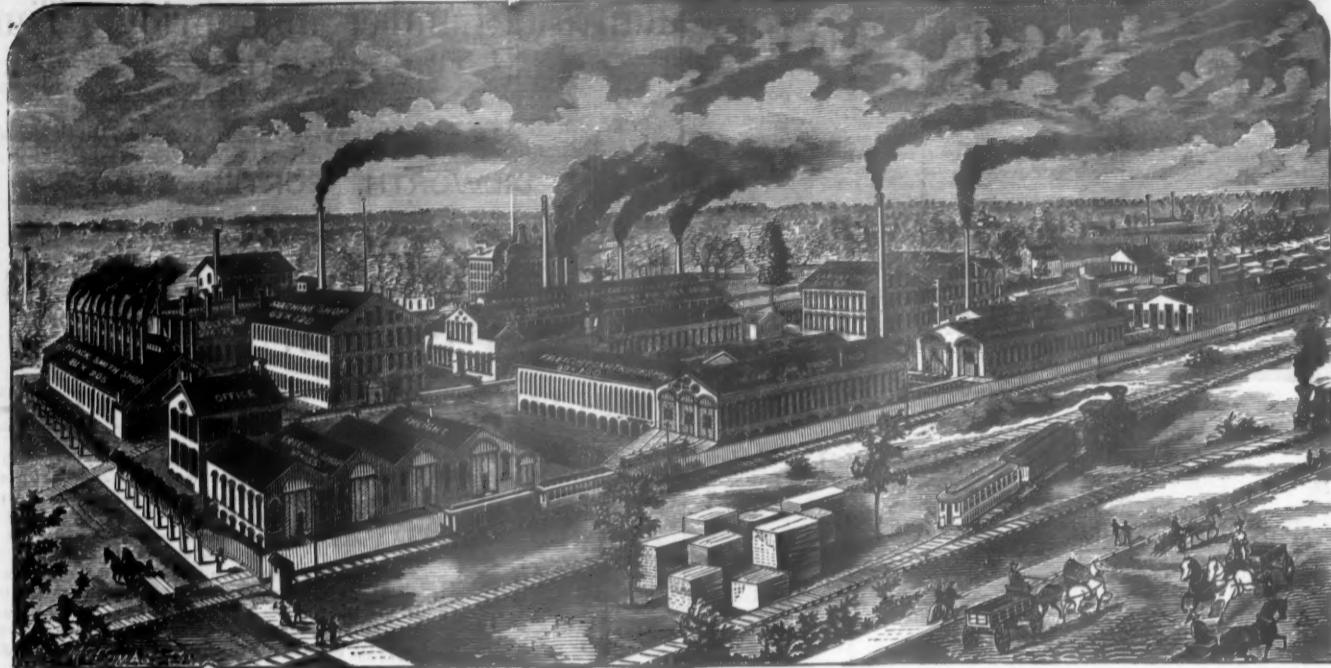
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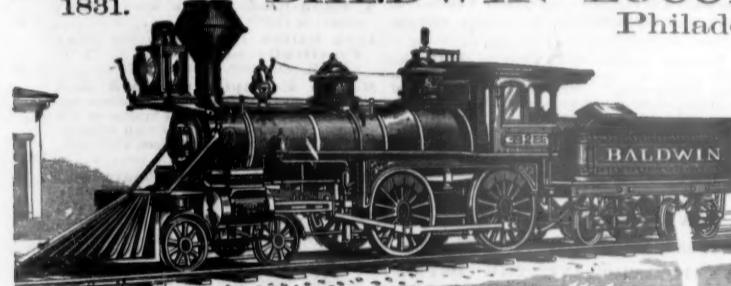
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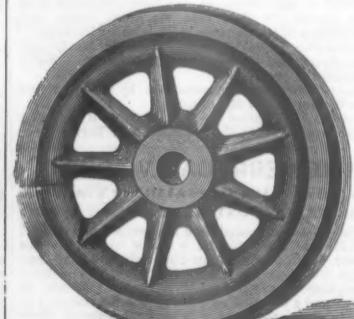
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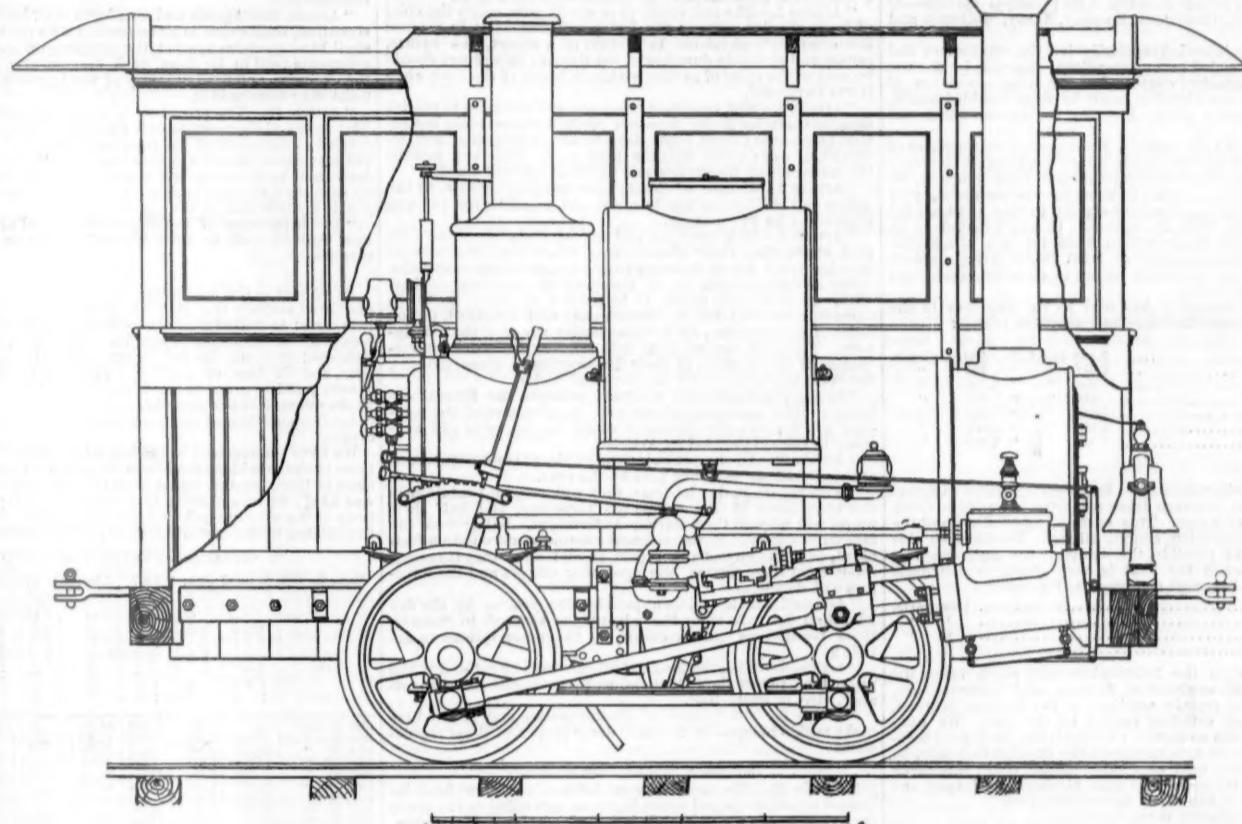
FRIDAY, APRIL 6, 1877.

Locomotive for Street Railroads.

The accompanying engraving represents a four-wheeled locomotive, built by Messrs. Porter, Bell & Co. of Pittsburgh, Pa., for operating street and suburban railroads. The engine is represented with one side of the cab removed. It will be seen that it is simply a small four-wheeled tank engine, the tank being carried on top of the boiler.

Messrs. Porter, Bell & Co. believe that there are great objections to the use of an engine and car combined in one vehicle, and the best results are attained if the engine is made entirely separate from the car, and with the common form of locomotive boiler and machinery, differing from ordinary locomotives only in its proportions, and in such respects as the nature of the work to be done requires.

The engine we have illustrated has 7x12 in. cylinders, but this firm builds engines of this plan of the following three sizes:



LOCOMOTIVE FOR STREET RAILROADS, by Messrs. Porter, Bell & Co., Pittsburgh, Pa.

Diameter of cylinders.....	6 in.	7 in.	8 in.
Stroke of piston.....	10 "	12 "	16 "
Weight in running order.....	9,000 lbs.	14,000 lbs.	20,000 lbs.
Length over all.....	11 ft. 6 in.	12 ft. 6 in.	15 ft.
Wheel base.....	4 ft.	4 " 8 "	5 ft. 9 in.
Capacity of saddle tank.....	150 gallons.	200 gallons.	375 gallons.
Diameter of driving-wheels.....	28 in.	30 in.	36 in.

The engraving represents the construction of these engines very clearly. The whole machine is enclosed so as to resemble a street car, and it thus takes up less room than horses, both on the track and for stable accommodation. The room required for a pair of horses is 14 ft., whereas the engine occupies a space of only 12 ft. 6 in., and as the engines run faster and need not be laid up for rest, one engine will do more work than several pairs of horses, so that much less room is required for shelter for the engines than for the horses; and owing to the greater speed of the engines not so many cars are required, and also less room for storing and sheltering them.

We are informed by Messrs. Porter, Bell & Co. that the New Orleans City Railroad is operating engines of this plan with 7x12 in. cylinders, and with others having 8x16 in. cylinders, but with a two-wheeled "pony" truck. The 7x12 in. cylinder engines make a trip of six miles, and return regularly in 80 minutes, hauling from two to ten loaded street cars, and when necessary can easily haul the same load at 20 miles per hour, not including stops. No inconvenience is experienced from smoke or noise, and the work is done at something like one-third the cost of doing it in a much slower and less convenient manner by mules, which have heretofore been chiefly used in New Orleans for this service.

Some accurate detailed and trustworthy data showing the relative cost of animals and steam power on the road referred to, and also the nature of the business, would have great interest and value at the present time, when the subject of the use of steam on street railroads is attracting so much attention.

Railroad Employees in France.

[Translated for the Railroad Gazette.*]

(Continued from page 140.)

§ 5. VARIOUS MEASURES ADOPTED BY THE EASTERN COMPANY FOR IMPROVING THE CONDITION OF EMPLOYEES IN THE DIFFERENT BRANCHES OF THE OPERATING DEPARTMENT.

No question, it seems to us, should more preoccupy chief managers of industries than that of the assistance to be secured to sick, wounded, infirm and aged employees. When the work is regular, and all the members of the same family are in good health, the pay of the workman and what can be added to it by his wife suffices for household expenses; but when sickness, wounds or infirmities occur, when old age comes, this equilibrium so laboriously attained is broken; and for long periods, often even for the rest of their lives, want strikes honest men who are worthy of the greatest attention.

It would be very interesting to ascertain and compare all that has been done by great industrial corporations, and notably by the great railroad companies, with a view to furnish a remedy to this situation, often so painful. We think that great progress has already been accomplished. A volume would be required to indicate all that has been proposed and realized in every direction; we will content ourselves with indicating what the Eastern Company has done and attempted up to this date.

The position of employees can be improved from two points of view: during their service, while they are still in good health; during interruptions caused by sickness, accidents and age.

During the first period (the longest), by means of certain measures which cost little comparatively, considering the means at its disposal, a great company can diminish the burdens which weigh upon all families. We refer to everything relating to lodgings, clothing, heating, lighting, various mov-

Clothing.—All those agents of a railroad whose duties bring them into contact with the public are uniformed, and it is difficult to understand, in France at least, that it should be otherwise. Generally this uniform is at the expense of the employees, and the companies have nothing more to do with it than to guarantee the different furnishers the payment of the sums due them; this payment is made by the aid of monthly retentions of wages.

The Eastern Company has undertaken to be more liberal by assuming about two-thirds of the expense of clothing its employees: the remainder is furnished by the employees by means of a fixed retention of 3 per cent. of their wages. Thus for \$9 a year a station-master on a salary of \$900 receives a complete uniform, which he has only to keep in good condition at his own expense. Renewals are made by the company at the rate of a pair of trousers, a vest, waistcoat, frock coat and cap every year, and an overcoat every two or three years, according to the employment. At the third renewal, the employee can use the garments first received for clothing their children; but they should always have two full suits.

This makes a material improvement in the condition of the employees in active service; but it enables the company on its side to require all its employees to make a good appearance in public, and it has no thought of changing a policy, now of long standing, although the expense resulting therefrom is quite large, as the following figures, covering only the operating service, show:†

Year.	No. of employees uniformed.	Expense.	Amount withheld from the company.	
			wages.	Expense to the company.
1859.....	2,768	\$67,097	\$17,769	\$49,328
1860.....	3,905	70,014	20,201	49,813
1861.....	8,151	71,121	31,445	49,676
1862.....	8,354	74,040	22,770	51,270
1863.....	8,278	82,640	23,797	58,843
1864.....	4,421	95,078	28,331	66,747
1865.....	4,696	99,094	31,061	67,973

ing expenses, etc., etc. Often even measures which cost a great railroad company absolutely nothing are sufficient to diminish greatly one of the greatest difficulties of living; under this head we will cite the possibility of living in the suburb of a great city.

In the second period, that of the interruption of labor, the Eastern Company has thought that it ought not to act alone, and that if it regarded itself bound to come to the assistance of its employees, the latter ought to consider themselves bound to lay up something.

Thus the aid distributed in case of sickness, wounds and infirmities is derived from two distinct sources: the first, provided by the company itself, acting as guardian of its employees; the second, arising from contributions required of the employees by the rules of the company—rules to which their attention is called when they enter the service of the company, and freely accepted by them.

We shall examine these two periods separately.

FIRST PERIOD.

MEASURES TAKEN TO IMPROVE THE CONDITION OF EMPLOYEES DURING THEIR SERVICE.

Heating and Lighting.—At the stations, the public waiting-rooms and the offices of the different agents must be warmed at the expense of the railroad company. The Eastern Company was convinced that it would expose its employees to temptation were it to oblige them to supply themselves with fuel and oil, alongside of the stocks of these materials provided for the station-service. Consequently it has decided that all station-masters, and also all in charge of warehouses, should have fuel and lights gratis; and in drawing up the list of materials necessary for a station or warehouse for these two purposes, estimates are made for the fireside and the table of the station-master.

The amount of this expenditure has not been calculated directly. We believe that it is not considerable; but in all cases it contributes largely to the comfort of a great many employees, who thus obtain lodgings, fuel and lights gratuitously.

* Du l'Exploitation des Chemins de Fer: par F. Jacqmin; Tome I., chap. 3, §§ 4 et 5.

† The only work that it would be well to require of the wife is indoor work—the care of children and housekeeping proper. Out-door work should be exceptional only.

The expense of clothing for employees in the other departments is not nearly so great. Almost nothing for the store-keeping and central service; it amounted to \$14,950 for 979 trackmen in 1864.

Including all branches of service, the expense in 1864 amounted to \$82,828 for 5,490 employees, or about \$15 per man. In 1865 this expense reached \$79,043 for 5,586 employees, or \$14 each.

Leaves of Absence—Passes.—The Eastern Company has not thought it best to make a rule for the granting of regular furloughs every year. The chief officers determine in each particular case and grant leaves on account of illness and family affairs duly authenticated. When the leave is given for a short time, no part of the pay is withheld; when the period is a considerable one, a half and sometimes the whole of the pay for the time is deducted. In all cases regard is had to the position and to the family burdens of the employee to whom the permit is given. All permits granted to an employee are noted on his descriptive roll, so that the frequency of the requests of this kind can be examined.

Leaves for several months, without salary, are granted to employees placed in the reserve and called to serve in the army. Finally, when an employee has been drafted, he is only provisionally removed from the rolls, and is restored on his discharge from the military service, if he is able to show that he has behaved well under the flag.

The number of available seats in a train being, with rare exceptions, greater than the number of passengers, the company can, without any increase in expenses, grant passes to those of its employees who wish to travel.

When an employee is removed from one place to another by orders, whether for temporary duty or a final removal, a first, second or third-class pass is given him, according to his rank; if the removal is to be permanent, a pass is given for the members of his household—his wife, children or parents.

If the removal is in consequence of leave of absence, passes may be given for the wife and children, according to the purpose of the journey and the services of the employee, the company considering the favor of passes as a reward which it has the right either to refuse or to grant.

‡ From these figures it appears that the cost of a uniform consisting of coat, waistcoat, vest, trousers, cap, and one-third to one-half of the cost of an overcoat on this road varied from \$21.30 to \$24.24 during these seven years.—TRANSLATOR.

Market and School Passes.—Stations are often situated where it is extremely difficult to procure the necessities of life or advantages for the education of children. In such a case one or two passes a week are given to each employee's wife and daily passes to his children to ride to and from the nearest town where there is a market or a school.

Dwellings in the Suburbs of Great Cities—Special Communications.—The constantly increasing price of rents in great cities, and especially in Paris, has induced a considerable number of families to establish themselves in the suburbs during the whole year. The Eastern Company has favored this removal, considering it advantageous to its employees, by granting season tickets to all those who declare that they wish to live in a place accommodated by its suburban trains. These tickets are good only on certain specified trains, which run at times corresponding with the men's working hours.

At the same time, if the employee requests it, a special commutation ticket is issued to the persons composing his household in the country, viz.: his wife, his father or his mother, if he is a widower and his parents live with him, and those of his children who are more than ten years old and are still supported by him. The price of this commutation ticket is fixed at one-fifth the price of ordinary commutation tickets, that is, at a very small sum.

Transportation of Provisions and Household Supplies.—Finally, the company authorizes the transportation, at the rate of $1\frac{1}{2}$ cents per ton per mile, of provisions and household supplies which the employee may receive from their relatives; the same rate is granted for furniture bought at the time of marriage, or inherited. These different measures diminish the expenses of every family without causing the company any loss; it may be affirmed even that, in many cases, such shipments, if they had to be made at full rates, would not be made at all.

Baths.—Bathing is a powerful aid to health, formerly almost unknown, which the working classes are beginning to appreciate. The regulations of the medical service authorize the physicians to prescribe simple baths to sick employees. The Eastern Company has thought it best not to wait till its employees become sick before giving them baths, and it has established bathing houses at seven of its principal stations—at La Villette, Troyes, Chaumont, Epernay, Nancy, Mulhouse and Strasburg.

These baths are intended especially for the enginemen and firemen, who are soiled in an exceptional manner by the use of coal in the locomotive engines; but the other employees of the company are permitted to profit by these establishments. Preference is always given, however, to the enginemen and firemen.

Sale of Coal to the Company's Employees.—The purchase of fuel for the winter months makes a very appreciable increase of expenses for families of moderate means. The company, for the purpose of doing a service to its numerous employees, puts coal at their disposition at a price similar to that at which the company itself buys it for its engines. It has adopted as an average price for its whole system \$4.00 per ton of 2,200 lbs. Coal is delivered in quantities of 1,100 lbs. to every employee not in lodgings who remits the money or an order payable out of his next month's salary.

In this way the company has sold to its employees in the operating department the following quantities yearly:

Winter of	1,100 tons*	to	700 employees.
1858-59	1,102	to	700 employees.
1859-60	1,017	"	796 "
1860-61	980	"	1,006 "
1861-62	975	"	992 "
1862-63	1,175	"	1,191 "
1863-64	1,460	"	1,442 "
1864-65	1,349	"	1,453 "

* Of 2,204 lbs.

Cold and Hot Drinks Furnished Employees.—During summer, workmen engaged in severe labor are often tempted to drink great quantities of water. This custom, especially when the water is bad, may occasion serious illness. To diminish this danger as much as possible, the company has authorized its station-masters, when the heat is very great, to distribute among the men a beverage composed as follows:

Water	1,000 parts.
Coffee	15 "
Boil sugar	25 "
Brandy	50 "

In the winter, when the temperature falls much below the freezing point, the enginemen, firemen and trainmen are, while running over certain sections of the Eastern Railroad, exposed to intense suffering caused by the cold. We have judged that this was an occasion for applying, at least exceptionally, a measure in general use on the Russian railroads, by giving hot tea to the men exposed to severe cold; this drink has a much more salutary effect than alcoholic beverages, and the results of its use have been very satisfactory.

The expenses attending these have been:

Summer of 1864, cold drinks	\$1,880
Winter of 1864-65, hot drinks	1,605

Total \$3,485

These amounts may seem to be considerable, but we must not lose sight of the fact that they arise from a very numerous force of men, and that (aside from the question of humanity, which should rank first) it is probable that the use of these drinks has prevented diseases which would have involved the company in greater expenses.

Publishing Acts of Probity and Devotion.—Very numerous deeds of devotion and uprightness are done every day, so to speak, by railroad employees, and the companies have been able to award or cause to be awarded to the authors of these deeds deserved rewards; but it is only in exceptional cases that a gratuity can be given or a medal obtained from the Government. Nothing was done for what we may call habitual acts of honesty or devotion. The Eastern has thought that these acts ought not to remain ignored, and it has decided that an "order of the day" should bring to the knowledge of the staff the names of employees who have distinguished themselves for any reason whatever. Published first at irregular intervals, these orders of the day had to be multiplied, and now the Operating Manager issues every month an order in which he calls the attention of the staff of employees to 30, 40 and sometimes 50 acts of probity or devotion done by the employees under his orders. Every employee whose name appears upon an order of the day receives a copy of this order, and mention of the fact is endorsed on his descriptive roll.

Doubtless the employees who restore promptly money found on the platforms or in the cars only do their duty, but this duty may be rendered easier by the thought that a moral recompense follows the doing of it.

Supply Societies.—The profits realized as well as the large expenses incurred by merchants who sell the necessities of life increase largely the prices of these different things, and endeavor has often been made to see if it were not possible to furnish provisions to small consumers at prices approximating as nearly as possible those received by the producers. Several great industrial companies and some large establishments have imagined and imagine still that they can secure the desired object by buying directly a certain quantity of articles of consumption and distributing them at cost price to their workmen. Sometimes even restaurants have been opened for the unmarried workmen.

The Eastern Company has not been willing to enter upon this path and run the risk of the inconveniences which have been revealed in some of the organizations which we have just

mentioned, such as the unjust recriminations made concerning the management of such stores, the quality of the articles sold and the pretended profits of the managers. It has decided that agents and workmen desiring to profit by the difference between the wholesale and retail prices of articles should become acquainted with the difficulties in realizing this desire. It has therefore been content to favor the formation of co-operative societies by granting them important assistance—such as the loan of a room, or the advancing of funds; but it has abstained from any meddling with the management.

Two societies were formed in 1866. The object of both is to procure the provisions and merchandise ordinarily consumed as cheaply as possible. These two associations, one organized at Paris and the other at Epernay, have emerged from the experimental and tentative period and seem to have reached a settled course of business.

Assistance when Provisions are Dear.—Whenever the price of bread has risen to an extraordinary point, all the French companies have given those employees who have low wages a monthly indemnity, intended to make up for the increase in expenses caused by this dearth. This indemnity varies with the number of persons composing the family of each employee. We will cite the following scale: one dollar a month for a married employee and his wife, and 50 cents more for each child under fifteen.

SECOND PERIOD.

ASSISTANCE GIVEN IN TIME OF SICKNESS AND INFIRMITY.

Provident Fund.—The rules followed by the Eastern Company are summarized in two very short documents entitled, "Regulations for the Provident Fund" and "Regulations for the Pension Fund." In analyzing these two regulations, we note at once the measures taken and the results obtained.

REGULATIONS OF THE PROVIDENT FUND, BEGINNING JAN. 1, 1862.

AID AT THE COMPANY'S EXPENSE.

"Article 1.—All employees and agents in the service of the company will receive gratuitously on their request, in case of sickness, the attendance of the physician chosen by it.

"Article 2.—The sick employee or agent will notify the chief of his particular service; the latter will immediately request the company's physician to certify, in a report, the nature, causes and probable duration of the illness; this report should be sent to the chief of service within 24 hours of the time when it was requested.

"Article 3.—Sick employees or agents will continue to receive their full salaries if the duration of their illness does not exceed eight days; from eight days to two months they will receive half pay; if the sickness lasts more than two months the managers of the service and the directors will decide.

"Article 4.—In case of death, the company grants to the widow and children of the deceased aid equal to his pay and allowances for two months.

"Article 5.—Sick employees and agents, if the physician's report states that their illness arises solely from their service, will be cared for at the company's expense for three months, either at their homes, or at the hospital, according to their wish. In case they prefer to be treated at home, the medicines will be paid for by the company and furnished, on the order of its physician, by the pharmacist whom it shall designate. They will receive their full salaries while sick; nevertheless, if the duration of their illness exceeds three months, the operating officers and directors will decide.

"In case of death, the company assumes the funeral expenses. The operating officers and the directors of the company will decide as to whether it would be proper to add anything to the aid granted by Article 4.

"Article 6.—All the prescriptions of the present regulations are applicable to workmen paid by the year.

"With regard to day laborers, they will receive gratuitously the attendance of the company's physician, and half their wages will be paid them during a fortnight, dating from the first day's illness. If the sickness continues more than a fortnight, or if the physician's report should show that it sprung solely from their service, the operating officers and the directors will decide.

"Article 7.—Sick workmen paid by the year or by the day who shall desire to enjoy the advantages assured to them by these regulations must conform to the prescriptions in Article 2.

"Article 8.—All assistance and all care may be refused if the physician's report shows that the sickness is due to intemperance, vice, or quarreling.

"Article 9.—The Council of Administration may at any time make such changes as it shall deem proper in these regulations.

AID FROM THE PROVIDENT FUND.

"Article 10.—The company establishes a provident fund intended to add to the aid which it grants, according to the above prescriptions, to its sick and wounded employees and agents, and, in case of death, to their widows and children.

"Article 11.—The distribution of this aid will be made in conformity to the prescriptions of Article 20 and the following articles.

"Article 12.—The provident fund is composed:

- "1. Of the amount of assessments on agents and employees;
- "2. Of the contributions made by the company;
- "3. Of the fines incurred by the agents and employees in the different branches of service.

"Article 13.—The assessment of each agent and employee is fixed at 1 per cent. of his salary yearly, payable one-twelfth monthly.

"This assessment may be increased temporarily by the Council of Administration, in case it is foreseen that the fund will be insufficient to meet the distribution of aid provided for, but in no case shall the amount of the assessment exceed 2 per cent.

"Article 14.—The company will pay over to the provident fund yearly a sum equal to the amount of the assessments of its employees and agents.

"Article 15.—The assessment is obligatory on all the employees who subscribe to the pension fund.

"Article 16.—The assessments of employees and agents, and the contributions made by the company, become, from the instant they are made, the absolute property of the provident fund, which disposes of them as described in Article 20 and the following articles.

"Article 17.—The provident fund is managed by the operating officers and by the director.

"Article 18.—At the close of each half year a report shall be drawn up of the condition of the provident fund. This report, after having been presented to the Council of Administration, shall be made known by the director to the agents and employees interested.

"Article 19.—In the report by the Council of Administration to the stockholders' meeting mention shall be made of the operations of the provident fund.

"Article 20.—The resources of the provident fund are employed exclusively in assisting the agents and employees of the company who have contributed by their assessments to the formation of the fund.

"Article 21.—Agents and employees not able to continue their work by reason of sickness shall receive from the provident fund an indemnity equal to half their wages, beginning from the day and continuing through the two months, when the company ceases to pay them the whole of it. There may be awarded them, moreover, an indemnity to meet the cost of the necessary medicines, on condition that these medicines

are prescribed by the company's physician and furnished by the pharmacist designated by it.

"In case the inability to work should last more than the two months during which the agents and employees shall have received the full amount of their salaries, in the proportions fixed by the preceding article, from the company and the provident fund together, the operating officers and the director shall decide as to the further assistance to be granted.

"Article 22.—The provident fund will provide for the funeral expenses in cases where, by the terms of the regulations, the company does not provide for them, and will grant to the widow and children of the deceased an indemnity equal to the amount granted them by the company.

"If the deceased leaves neither widow nor children, this indemnity may be granted to his father or mother.

"Article 23.—Independently of the indemnity fixed by Article 21, the operating officers and director will determine as to the additional assistance that it might be proper to grant to the widow and children of the deceased agent or employee, and to his father and mother, if he leaves neither widow nor children.

"Article 24.—If the inability to labor caused by sickness becomes permanent, besides the aid fixed by the preceding articles, there should be granted to the disabled agents and employees, an indemnity equal to the total amount of their assessments and of the corresponding contributions made by the company.

"Article 25.—If the report of the company's physician shows that the disability is caused by an illness due to intemperance, vice or quarreling, the aid provided by the provident fund may be refused.

"Article 26.—The amount of aid furnished from the provident fund during any one year should be limited to the sum of the assessments and contributions for that year.

"Still, if through extraordinary circumstances the amount of the assessments and contributions were to become insufficient, the director, in conformity to the second paragraph of Article 14, should request the Council of Administration to raise the rate of assessment temporarily, in order to reimburse the company for the advances made by it to make up for this insufficiency.

"Article 27.—Agents and employees who, by dismissal or resignation, shall cease to be connected with the company's staff, shall have no claim against the company on account of the assessments paid in by them, such assessments having become the exclusive and final property of the provident fund the moment they were paid in.

"Article 28.—The provident fund shall be settled every year. The excess of the receipts over the expenses of a year shall be carried to the credit of the pension fund. This payment shall not take place, however, whenever the capital of the provident fund shall be less than the amount reached Jan. 1, 1862. In no case shall the said payment be greater than the company's yearly contribution to the provident fund.

"The investment of the disposable capital of the provident fund shall be made in the company's bonds or in government securities."

As we said at the beginning, the establishment of the provident fund realizes the plan which the Eastern Company had proposed: to unite its efforts to the personal efforts of its employees to remedy as far as possible the sufferings occasioned by sickness; to secure the full income during the time of the sickness, and in case of death the payment of the funeral expenses; and to grant to the widow or children assistance equal to the amount of four months' pay—assistance which in many cases the condition of the provident fund has enabled it to increase.

We have summarized in the following table the total operations of the provident fund from its origin in 1853 down to the close of 1865. In the latter year the number of subscribers was 5,517; their assessments reached \$13,750; the contributions of the company reached the same figure of \$13,750, and the balance in the treasury Dec. 31, 1865, amounted to \$83,830.

OPERATIONS OF THE PROVIDENT FUND

From its Origin until Jan. 1 1867. (Accounts presented half-yearly.)

Year.	Total receipts	Assessments	Contribution	Total paid out	Balance in treasury
1853, 2d half	1,639	\$4,961	\$11,393	50	\$8,666
1854, 1st	2,548	6,950	11,393	205	870
1854, 2d	2,940	8,150	15,300	223	10,515
1855, 1st	1,015	9,362	21,190	3,735	10,755
1855, 2d	2,431	3,422	10,206	34,627	345
1856, 1st	3,424	4,033	11,712	44,154	2,355
1856, 2d	4,050	4,850	11,785	52,516	987
1857, 1st	4,063	4,865	11,785	53,547	5,237
1857, 2d	4,510	5,304	15,945	64,525	1,617
1858, 1st	5,523	6,347	16,667	63,190	19,032
1858, 2d	5,071	6,071	16,736	60,840	2,203
1859, 1st	6,764	7,434	16,233	70,017	9,096
1859, 2d	7,930	24,391	86,372	2,467	21,216
1860, 1st	6,156	8,496	23,365	93,262	14,333
1860, 2d	8,913	9,336	92,265	2,263	7,835
1861, 1st	7,480	10,053	94,495	16,900	77,025
1861, 2d	7,025	26,053	94,595	19,839	74,756
1862, 1st	8,540	11,511	116,251	26,570	98,679
1862, 2d	9,479	8,988	28,412	126,991	2,723
1863, 1st	8,840	10,139	27,546	111,398	12,162
1863, 2d	9,224	11,276	31,276	130,499	2,274
1864, 1st	8,840	11,903	32,318	116,158	2,177
1864					

Contributions.

Train Dispatching.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the *Gazette* of March 16 are two communications upon the subject of train orders indirectly referring to the collision that occurred on the Chicago, Burlington & Quincy Railroad, near Quincy, in January last. One of these articles, signed "H. C.," sets out to be a reply to my article of February 16; but I nowhere find any reply to the points I undertook to make. The real question is serenely "begged," and my attempted demonstration of the features of the case that made it special and peculiar is calmly wiped out by the assertion that no special peculiarity in such a situation exists. I should welcome a refutation of my position were it accomplished by correction of mistakes, either in the premises or conclusions, but I see nothing so far that in the least affects the soundness of my statements, hasty and imperfect as they were.

There is one point in "Cow-catcher's" article that is worthy of marked notice. He admits that the form of train order suggested both by "E. C. Centric" and myself would have saved the collision, but the order would have been condemned by the "Round-House Caucus" as an intimation that the dispatcher might "think that the men didn't know their business." Heaven save the traveling public! They must not receive the protection of sure precautions that are in the hands of dispatchers for fear of offending the dignity of the "Round-House Caucus!" When such sentiments can be published in the leading railroad periodicals of the country, it would seem to be time that this business of train dispatching should receive some intelligent attention and examination.

In the same paragraph "Cow-Catcher" advocates the proposition that a better understanding between dispatchers and train-men would be beneficial to the service, "the former standing less on their dignity or fine points, and the latter exercising less talent for malice." Without meaning to be dogmatic or arbitrary, I beg to take the ground that the very greatest defect in train dispatching to-day is the continuous desire and tendency of train dispatchers and train-men to have a good understanding with each other. The system of the dispatching would to-day be far in advance of its actual standing had dispatchers and train-men never been permitted to see or speak to each other or in any way communicate with each other except in the formal language of orders and replies. So much assertion requires some demonstration, but I can only glance at a few of the reasons for this position, which, notwithstanding its apparent dogmatism, I would be glad to see fairly and honestly controverted. It looks almost paradoxical, but is nevertheless, I think, absolutely true that the knowledge and experience of train-men is the entire basis of train dispatching, and yet it is impossible that a train-man, while on duty, should know anything about the merits or defects of the orders he receives, except as to their technical safety as applied to his specific circumstances only.

The reason is that the train-man sees only his own train and its immediate conditions. The dispatcher sees all the trains at once, and their relative positions. The train-man's judgment could not be equal to the train dispatcher's without an equal knowledge of the circumstances, which he cannot have. To make a stronger illustration and to show that this fact in no way reflects upon the intelligence or honorable position of train-men, it may be said that the best train dispatcher in the country placed in similar circumstances with the train-man would be no better judge of the orders given at the time. Now it is obvious that train-men, or any other men, cannot overcome the natural disposition of the human intellect to question and criticise orders and regulations which govern them, and consequently they form all sorts of erroneous theories based upon erroneous facts and stubbornly uphold them. The result is that when they have free communication with dispatchers they engage in wrangling and fruitless controversy, which is the more unprofitable, as it is utterly impossible for a dispatcher to explain to any one all the minute reasons that may have actuated him in giving his orders. I defy any dispatcher to communicate clearly to any other dispatcher or person a full and complete account of all the occurrences of thought and circumstance that surround him during six hours' handling of twenty trains. It is beyond human power. Suppose any intelligent man could catch and fix intelligibly all the thoughts that circulate through his brain! That would be such a production as the world never saw. The greatest writing of the world would dwindle into insignificance beside it.

The evil, then, that results from this effort to have a good understanding between dispatcher and train-men arises from the utter impossibility of their conceiving the same facts, and culminates in a false disposition to be personally friendly or familiar at the expense of the service. All this dwarfs the growth of train dispatching, which ought to be a science, and correspondingly injures train service in all its branches.

The fact that train dispatching is founded upon the experience and knowledge furnished by train-men is none the less true, notwithstanding what I have said, and the credit and honor of having worked out experimentally the laws of train dispatching belong largely to train-men. It is they who have tried all the theoretical rules of inexperienced managers and found where they were wanting. Their opinions and experiences should be carefully treasured and thoroughly examined. But this experience and these opinions should be communicated in the cool dress of writing—not in the heated nakedness of personal conversation. Train-men should criticise and reason upon all that affects their profession. It is only the mode that I venture to suggest. Their communications should be made to their superintendent, not to the train dispatcher. They should preserve toward the dispatcher the form of silent compliance with orders, and appeal to the superintendent in all cases of questionable orders.

What a Brotherhood Engineer Thinks About Strikes.

JERSEY CITY, April 2, 1877.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read with interest your editorial in *Gazette* of March 30, and am pleased to see one paper at least that is disposed to give the locomotive engineers a good word. It has become quite the thing lately to heap all kind of abuse upon us, especially if we belong to the hated Brotherhood. As a member of it, and as a locomotive engineer, I would like to give my views upon some of the questions at issue as well as to let the public know a few facts that they seem to be ignorant of. We on the Central Railroad of New Jersey have been abused without stint for stopping our trains and leaving innocent passengers on the road at midnight. Do the public know that 12 midnight was chosen because there were fewer passenger trains out then than at any other time? Do they know that there were but two on the road then, and that the one leaving Elizabeth at 11:45 had but a single man on it and he going to Bergen Point, where he was taken, while the one leaving Newark did not have more than a dozen, and they did not get out of city limits? Do they know that the Superintendent was notified in ample time to have the road clear of trains from Easton to Jersey City, had he been disposed to do so? He was of the opinion, and expressed it, that he didn't believe the engineers would stop. He thought that as they had stood so much imposition in the past they hadn't courage enough to rebel. Well, he found out his mistake. We made a mistake in stopping the trains on the road, but only because the railroad companies made capital of it, when really the officers were responsible, because it was in their power to prevent it. You say in your paper that it has had an effect that we did not anticipate in provoking hostile legislation. Let me assure you that we have watched that legislation closely, and we are of the opinion that our hands are not tied as yet. The legislators who made hostile laws will find in future elections that railroad men have votes and some influence in elections, and they will be used, too. I see in a communication signed "Supt." that he excepts from his condemnation of causes of strikes "arrearages of pay." We have suffered from that cause as much as the men on any railroad in the country, and I assure "Supt." that the entire loss of the back pay due us would be little felt in comparison with wrongs and impositions that we have endured on this road before we were driven to strike. Does the public know what use was made of the victory won by these same men who are vilified in every public print almost without exception. They demanded a reduction of twenty-nine cents per day for doing the same work: in other words, we were paid, in all cases where first-class men were running 100 miles per day, \$3.75 under the old system; under the new we take \$3.46 for doing the same work. In one case the engineer gets \$15 per month less than he got before! The only advantage we reap from the new system is, we have a standard day's work, and when required to make more miles we are paid for doing it.

Is that unfair? Under the old system the company required a man to make as many miles as they saw fit, but no corresponding increase in pay was made. We challenge railroad officials to show any case where they have used a victory in such moderation. Again, we hear so much of our obligations to the public. The terms must be mutual, for if we are under obligations to them they are to us, and I fail to see a single instance in which we owe the public even good will. For if the press is the criterion to judge from, they are our enemies, in this part of the country at least. While legislatures are devising means to protect the public, they overlook one very important means of protection, viz., putting good men on their locomotives. A company will, and does, put men on its engines to haul passenger trains that ought to be using a pick and shovel if put in their proper positions; also in case of a strike I know that they put men on to run their most important passenger trains that under any other circumstances would not be allowed to get on the engine at all. But no; instead of passing laws requiring railroad companies to hire none but competent men, they waste time in passing laws that will not cover the cases intended at all. The locomotive engineers, and especially those of the Brotherhood, would be perfectly satisfied to arbitrate all difficulties that may arise between the officials of a railroad and themselves, but let the men propose anything of the kind, and these high and mighty officials consider that they are insulted. The result is a strike, or the best men on the road leave it. The late action of the Reading Railroad officials shows the animus pervading the whole of the official fraternity. They say: "Here is an organization that dares dispute our will: we'll crush it." Well, perhaps they may; but if we don't make it a costly crushing, we are very much mistaken. If necessary to die, we will endeavor to die like Samson did. But how much better for companies, officers, men and everybody concerned to have them act toward the men in a fair manner and, as you propose, make them participants in their prosperity, and my word for it they will cheerfully assume their share of adversity. I must apologize for occupying so much of your space.

CENTRAL RAILROAD OF NEW JERSEY ENGINEER.

The figure of Samson crushed beneath the ruins of the temple, which he pulled down on himself, is very grand and tragic, but if we were to say that if the members of the Brotherhood of Locomotive Engineers should try to play a similar part they would be doing a very unprofitable and foolish thing, we might appear to take a very mercenary view of their position; and yet we believe it would be a correct one. Certainly we have no desire to express anything but the highest admiration for the heroism which locomotive engineers sometimes do exhibit, but when no good end is to be attained by being heroic, then heroism is foolish. Now, if the members of the Brotherhood should succeed in destroying the prosperity of all

the railroad companies in the country, and of dying grandly among the ruins, who would be any the better for it? When people do such things as buying property or trading horses, they do not become tragic, because tragedy disturbs the mind, and upsets the exact balance of judgment, which it is so important to preserve at such times. Now locomotive engineers are engaged in a similar transaction to that of trading horses, but on a much larger scale—that is, they are trying to dispose of their labor to the best advantage—and to do this it is of the utmost importance that they should keep their heads clear, which they may remember Samson did not do.

Then, too, the sore-head business is about the most unprofitable occupation in which human creatures can engage. There is very little use in howling after you are hit. If the members of a trades-union determine to submit their case to the arbitration of a strike, and are beaten, they must accept the result, and the only creditable thing about it will be the patience and fortitude with which they do it. The unspeakable folly of doing rash and unlawful things, or, in other words, of playing Samson, is what so generally alienates public sympathy from them.—EDITOR RAILROAD GAZETTE.]

Good Locomotive Service.

KINGSTON, Pa., March 28, 1877.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the *Gazette* of March 16 I noticed an article signed "F. I. Gures," giving the record of engine No. 84 on the Cleveland & Pittsburgh Railroad, and asking if any one could excel it.

The following record of engine No. 12, running on the Bloomsburg Division of the Delaware, Lackawanna & Western Railroad, I think will excel that of engine No. 84, spoken of by "F. I. Gures":

Since she went out of the shop in March, 1874, she has run 102,880 miles, and being in very good order yet, is likely to run at least 30,000 miles more before it will be necessary to bring her in, even for slight repairs. Her tires have been turned once during this time, which is the only time she has been raised off from her drivers. She is a standard freight engine with 16 x 24 cylinders, 56 in. driving wheel centre and weighs 73,000 pounds, was one of a lot of seven engines of that class built at the company's shops in this place, and was run by Engineer Edwin Purdy (who is still running her) during all this time. Below I give average cost per mile run compared with the same for engine No. 84, excepting for fuel, of which we keep no record and therefore cannot give it:

Mileage.	For r.pairs.	For stores.	Wages.	Total.
Engino No. 84.	102,717	1.05 cts.	0.77 cts.	7.07 cts.
"	12,060	0.95 "	0.86 "	6.06 "
				7.87 "

RECORD.

The First Locomotive West of the Alleghanies.

Lake Shore and Michigan Southern Railway,

CLEVELAND, O., March 26, 1877.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have recently spent some time in compiling a condensed history of the dozen or more original companies now embraced in this organization. The first company was the Erie & Kalamazoo, from Toledo, Ohio, (then claimed as Michigan Territory) to Adrian, Mich., 33 miles.

This road was incorporated in 1834, and built in 1835 and 6, on stringers with flat rail, and operated with horses. In August, 1837, the first locomotive arrived at Toledo.

E. H. Williams, of the Baldwin Locomotive Works, writes thus concerning this engine:

"With reference to the first two locomotives for the Erie & Kalamazoo Railroad I find the 'Adrian' was numbered 80 on the books of the Baldwin Locomotive Works and the 'Toledo' 90. The former was shipped May 15, 1837, the latter Aug. 14 of the same year. They were similarly constructed with dome boilers, single pair of driving-wheels placed behind the firebox, these wheels being 4 feet 6 inches diameter. The cylinders were 9 x 18 inclined and inside connected. Frame of wood plated with iron."

The terminus of the road was originally in a public square at Adrian, and the engines were filled with water from a reservoir composed of hogsheads mounted on a high platform in this square.

The third locomotive purchased by this road was Rogers No. 3, and accurately described in your issue of March 23. The Erie & Kalamazoo Railroad Company changed its name to "Tecumseh" after purchasing it from the Lockport & Niagara Falls Railroad in 1843.

So far as I can ascertain, the "Adrian," shipped from Philadelphia May 15, 1837, was the first locomotive west of the Alleghanies. Am I correct?

C. P. LELAND.

The Location of the Cincinnati Southern.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I am happy to know that the writer on the alignment of the Cincinnati Southern Railway considers the South Fork of the Cumberland line and the Sequatchie Valley line "side issues" and "trivial" at that. I had no hope of making him see this.

Now I shall begin to read the articles and wade through them to the bitter end. Now my faith in his judgment increaseth and day unto day it gaineth strength, since these proposed lines have been so gracefully "side tracked;" there is a twinge of regret that they were ever tacked on to the main line of the discussion at all. However, *obtuse* as I am, it is pleasing to know that an *under estimate* of *five hundred per cent.* is a "trivial side issue," especially pleasing when he who made the estimate could have found out in regard to it by reading the "official report," if he had not been so thoroughly wrapped up in the "chimera" of an "alternate location."

I understand *pretty* well that the writer on "Justifiable Expenditures" etc., places only a small value on the first cost of construction, that it is but *one* of the *many* items to be taken

into consideration in estimating the cost and worth of a railroad. About this there can be no controversy between us. Let it be granted to pacify the bellicose. All I have sought to do in this latest unpleasantness was to bring this to his notice, in as gentle a manner as possible, that in the matter of the Sequatchie line he inadvertently lost sight of \$552,000 on 40 miles of line, and if the unbelievers should find it out, they might suspect, although they might "hesitate to say," that the same might be true in a like degree in his estimate on 344 miles, which would amount to the not very trivial sum of \$4,128,000; or, the error being in the same ratio, the benefit which would be derived from the "alternate location" would be derived from the city of Cincinnati, instead of to it.

It is not said that these things would be so, but it is much to be feared that many unsuspecting individuals might possibly think so.

It was proposed, Mr. Editor, to bring these things to the gentleman's notice without exciting the curiosity of the public. If there has been a failure it is to be regretted. There is this consolation left, that others have been "similarly placed," else why did the poet sing:

"Twas ever thus, in childhood's happy hour

I've seen my fondest hopes decay."

Let me make the following suggestion: Since it matters less about the length of lines than the height of summits, and since the height of summits matters little, why not come down into the valley of the Cumberland by the Rock Castle River, thence following up the Cumberland to a point opposite Cumberland Gap (a long line with low grades), thence through Cumberland Gap to Powell's River (a fit place for the "central rail"), thence down Powell to the Clinch, and by the Clinch to the Tennessee?

You would circumnavigate the coal fields and take in Knoxville, by the way, and moreover have a line conforming to a beautiful theory.

This is left as food for the contemplative and analytic mind.

JAMES D. BURR.
A. T. & S. F., March 23, 1877.

The Pleasures of Hope.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The Greenwich Street Elevated Railroad Company have certainly marked a new departure in this respect—if no other—that they hopefully call part of their locomotives after the places or neighborhoods which they expect some day to reach. That this day may itself be shortly reached is the hope fondly and long indulged in by many a weary horse-car strap-hanger-on, but there is a growing conviction on his mind that it will be like many kindred hopes so long deferred that his heart can no longer ward off the sickness that grows upon it.

If, however, hopeful anticipation be as cheap as grumbling over present ills (and it certainly is far pleasanter) then this new Greenwich street departure is in every way to be commended. How vastly better it is, for instance, to be so joyously carried along by the "Yonkers"—even though your road may not reach within ten miles of that place, and though your journey may never extend so far—that to be dragged up or down by say the "Rector street" or even by the "Ninth avenue." So, too, it may be safely believed that the average citizen would prefer to be carried home by the "Brooklyn" from the Central Park than by say the "lower end of Greenwich street," however certain this citizen may be that the latter place will surely be reached, and however uncertain whether he will soon get any farther than that savory neighborhood.

There is another side to this anticipative view, and that is the financial phase. Who, for instance, would not take heartfelt comfort in riding behind the "Sure dividend of two per cent. quarterly," or even the "Three per cent. semi-annually"? What serene satisfaction would a man take, whether a stockholder or not, in seeing the "No dividends for eight years" or the "Dreadfully stinted for repairs" hauled off, and replaced by the "Ample amount carried yearly to surplus fund" and the "Tenth new one this year!"

What new hope would spring eternal in the breast even of a holder of Erie common if he should see rolling into Jersey City daily the tangible embodiment (even of the hope only) of "Complete double track of standard gauge" or of "Ample first-class equipment!"

So, too, if our coal roads only had a few such locomotives as "Strict accuracy in current reports" and "Three-fold greater demand for coal at lower prices," then the black diamonds would really sparkle anew on their arrival in market, and stockholders would draw breaths of relief after the lifting thus of their load.

It is clear that if there is a good time coming, and we expect to get there by rail, then our locomotives, as the pioneers of our journeys, may most properly be so named as to conjure up and maintain the clearest anticipations of the coming prospect and to keep them constantly before our vision, so often too faithless.

I am, always yours, in

ANTICIPATION.

Improvement in Surveying Instruments.

For the following description of this improvement we are indebted to *Engineering News*:

The improvement consists in a new arrangement affording a more convenient, rapid and safe attachment and detachment of the instrument to and from its tripod than any other device so far employed.

On the tripod head, instead of the ordinary screw, there are three projections, the lower faces of which incline in the manner of a screw. These projections are at the same height from the shoulder of the plate, and are one-sixth of the periphery in length, thus leaving between them a space of the same size. The base-plate of the instrument has on its inner side three similar projections, and also the same number of spaces. The connection of the two is done by letting the projections of the base plate pass through the spaces of the tripod head, when a slight turn to the left will effectually join the instrument to the tripod. The accompanying cuts clearly show the construction of the new arrangement.

Fig. 1 is a plan of the base-plate of the instrument. Fig. 2

is an elevation of the tripod head. Fig. 3 is a sectional cut of the lower part of a transit. The little knob which is seen underneath the tripod head in Figs. 2 and 3 is attached to a spring catch, which is designed to prevent the falling off of the instrument from the tripod when carried on the shoulder, in case of neglect to properly fasten it.

The advantages of this arrangement will be better understood after examining the present employed methods of attaching instruments. Transits are now generally connected to the tripod by means of a screw at the base plate. To attach an instrument by this method is very tedious and unsafe; sometimes the screw does not catch and the instrument is liable to tip over. To avoid this a good many instruments detach above the leveling screws in the centre, which, however, is very defective. It is almost impossible to keep the centre clean; a little dirt will often cause it to move very hard, and sometimes it will fret. Some instruments are made detachable above the leveling screws in such a manner as to always keep both centres covered and remaining with the instrument proper, re-

"This weight is equal to 12 locomotives, or to a crowd of over 7,000 people.

"Altogether, there were on the main span at the same time 48 teams, with 176 horses or mules, and about 900 people.

"With all this load on, the bridge deflected four inches in the centre of the span, which is only one-half of an inch for every 100 feet of span, whereas the deflection allowed in railroad bridges is mostly one inch for every 100 feet. *

"The most interesting part of the test was the observation of the undulations and oscillations of the bridge under the moving load. For this purpose two level instruments and one transit were used, the levels being placed upon the piers at each end of the main span and the transit upon the Southside embankment.

"The oscillations could scarcely be noticed; the up and downward movement during the passage of the load were not over one-sixteenth of an inch; the lateral motion in the center of the bridge five-sixteenths of an inch.

"When one-half of the span was loaded and the other half unloaded, the loaded side deflected $2\frac{1}{4}$ inches and the unloaded side was raised $1\frac{1}{4}$ inches, which is simply due to the elasticity of the material, and proved the stiffening system of the bridge a complete success.

"The expectations in respect to rigidity of the bridge were quite surpassed by the results. Point bridge can certainly be claimed to be the first successfully stiffened suspension bridge in the world, and considering its magnitude, together with design and workmanship, in and will remain a model of an engineering structure."

The bridge itself is thus described by the same paper:

"The plan finally adopted was a stiffened chain suspension bridge, submitted by the American Bridge Company of Chicago, and designed by their chief engineer, Mr. Edward Hemberle. This plan represents all the good features of a modern chain suspension bridge and has, in addition, a novel stiffening system, which, as far as theoretical investigations and judgment can determine, seems to obviate all the faults of wire cables and of the formerly built chain suspension bridges. *

"Mr. Hemberle's plan, as represented by Point bridge, consists of towers, chains with platform suspended therefrom in the same manner as in a regular chain suspension bridge; in addition thereto is a stiffening system above the chains, and rigid posts arranged between chain and platform to prevent the roadway to undulate or oscillate independent of the structure above. The stiffening arrangements above the chains consist in rigid chords running in straight line from the top of the towers toward the center of the chain, and being connected thereto by a hinged joint at each end. Between these chords and the chains is a system of bracing, consisting of posts and diagonal tie-rods. All connections are pin-jointed. The chain, being catenary, or curve of equilibrium, takes up all the permanent load of the structure, without bringing strains on the stiffening trusses. This object was accomplished by erecting the bridge completely before connecting the ends of the straight top chords to the center joint. The rods are provided with turn buckles, and are so adjusted as to be strained under moving load only.

"When the bridge half loaded the top chords of trusses on the loaded side will be in compression and the unloaded side in tension. There are lateral and vibration braces between the top chords and also between the chains, proportioned to take up the strains from wind pressure upon the chains and trusses.

"A model of Point bridge was exhibited at Philadelphia and received an award, and Mr. Hemberle was the recipient of quite a number of complimentary letters from most prominent American and foreign engineers approving his new plan. **

"The total length of the Point bridge is 1,245 feet from back to back of the anchorages, with one middle span 800 feet between center of piers, and one independent trussed side span of 145 feet in length at each shore. The roadway rises from both shores toward the center of the channel with grades not exceeding $3\frac{1}{2}$ feet in 100—the highest point of the roadway being 88 feet above low water. The saddles upon which the chain rests on top of the towers are 180 feet above low water. The deflection of the chain is 88 feet—which is considerable more than usual for suspension bridges—but the stiffening allows of increasing the deflection and thereby reduces the strains in the chains and their weight. The bridge is 34 feet wide from center to center of outside rails and the space is divided into a roadway 21 feet wide and two sidewalks of $6\frac{1}{2}$ feet each by inside iron handrails. The piers up to the roadway and the anchorages are built of masonry. They are founded upon timber platforms sunk to a gravel bed below low water. The masonry is of the best quality—Baden sandstone laid in cement mortar.

"The towers are entirely of wrought iron, except the bases of the columns. Four columns, each 30 inches square, are braced together by lattice work, form the support for each chain, which are carried at the top of the towers on wrought-iron saddles, which are movable on steel rollers to allow for expansion and the elongation of the back chains under strain.

"The chains are formed of link bars, 20 ft. 6 in. long, varying in size from 8 to 2 inches to 8 by 1 inch, connected by pins 6 inches in diameter. There are 12 and 13 bars alternatively in the back chains, and 11 and 14 bars in the main chains. Stiffening trusses on top of the chains are 22 feet high in the middle, and their upper chord is box-shaped, with full rivet-splices to resist tension as well as compression.

"Outside of the floor are roadway trusses 8 feet high, part above and part below the floor. They are built continuous in lengths of 100 feet and are joined together at their in-ends in such a manner as to allow for expansion and contraction of the iron work. Those trusses are suspended from the chains by iron rods placed in pairs every 20 feet and by rigid posts every 100 feet. Iron cross girders, 3 feet in depth, connect these roadway trusses every 20 feet and support two intermediate lines of iron stringers. These stringers and the roadway trusses form the bearers across which are placed the wooden joists for the flooring.

"The roadway consists of two courses of $2\frac{1}{2}$ inch oak planks, the lower course being laid diagonal and the upper lengthways to the bridge. Two street car tracks are laid upon the floor. The side-walks are laid with narrow 3-inch planks of southern pine.

"The lateral stiffness of the floor is secured by a double system of tie rods and the wind pressure is taken up by four horizontal steel wire cables, placed under and connected to the floor.

"The specifications for the Point bridge call for moving load of 1,600 lbs. per linear foot, to be carried by the structure in addition to its own weight, with a factor of safety of 5; that is, it would require five times the above load to break the bridge down. The 1,600 lbs. per linear foot is for the 900-foot span, equal to 1,280,000 lbs., which weight is equal to 16 locomotives, or equal to the weight of a crowd of 9,000 people. Such a load is very unlikely ever to come on the middle span of the bridge, and five times that load would not injure the iron work. The back chains on each end of the bridge have a sectional area of 384 square inches, and were all put to actual test of 10 tons per square inch without showing any injury, which will make their reliable supporting power equal to 8,840 tons. For the floor system and the suspenders the proof load is taken at 996 tons for the middle span.

"There are 156 suspension-rods carrying the floor, each with a strength of 47 tons, as proved by actual tests, which will make their supporting power equal to 7,132 tons, which is equal to the weight of 180 locomotives.

"Each of the towers has a sectional area in columns of $54\frac{1}{2}$

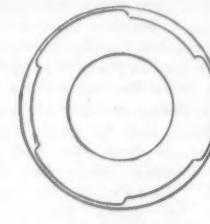


Fig. 1.

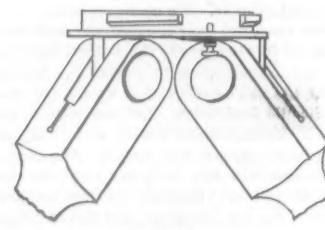


Fig. 2.

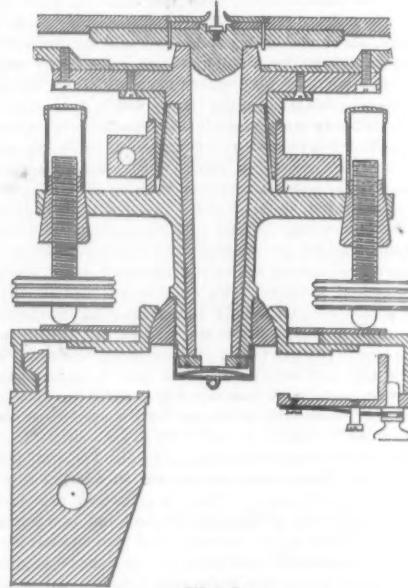


Fig. 3.

quiring, however, an intermediate piece between the leveling screw-plate and the centres, which adds unnecessary weight. In both constructions the plates have to be brought too high above the leveling screws and therefore cause unsteadiness.

The same reason which led to taking apart the transit above the leveling screws, viz.: "the unsafety and inconvenience of attaching and detaching," also caused the different methods of taking apart levels. While some are constructed so as to leave the centre on the instrument proper others allow it to remain in the parallel plate. The latter method is the more defective of the two, because it throws the wyes out of adjustment every time the least dirt settles on either the socket or the cone, and because the bars and wyes have been brought too high above the leveling screws. Both constructions have one common defect. The cone and the socket have to be brought together tight to make the instrument steady, and in order to take it off again, it generally requires a sudden shock, which, of course, is liable to throw out the adjustments.

From the above it will be seen, that dividing an instrument in two parts is always injurious to accuracy, stability, etc., and that the new arrangement, which remedies all these defects, is a decided improvement. It is made by Messrs. Nickel & Strausberger, the well-known engineering instrument makers, No. 128 Clark street, Chicago, who have applied for a patent.

The Point Bridge at Pittsburgh.

The preliminary test of this bridge, which took place March 31, is thus described by the Pittsburgh *Dispatch*:

"After Mr. Painter and company had passed the bridge in carriages the heavily loaded teams being stationed along Carson street, on the south side, drew up in file upon the bridge. The approaches not being paved yet, and consisting of new fill, made it difficult to pull the heavy loads upon the bridge. The teams were arranged two abreast, a case which will never occur under regular traffic, but this was done to test the resistance of the structure to its utmost. The following statement gives the number of teams, their weight, and the total weight being at the same time upon the bridge:

	Tons.
2 six-horse teams.....	27
12 four-horse teams.....	120
1 three-horse team.....	8
5 two-horse teams.....	30
1 one-horse team.....	2 $\frac{1}{2}$
2 buggies.....	2
25 four-mule teams.....	225
Weight of people on the sidewalks.....	60
Total weight upon the middle span.....	474 $\frac{1}{2}$

square inches, and their resistance against failure under the load would be equal to 10,000 tons, whereas the load which ever can come on them is only 1,800 tons.

The lateral cables under the floor are at each side, double $\frac{1}{2}$ -inch cast-steel wire ropes, each having an ultimate strength of 210 tons. They would resist the greatest strain brought sideways against the bridge in case of a hurricane, and the bridge has already, under severe winds, proved to be absolutely rigid sideways.

The total cost of the bridge is about \$525,000, which is very low compared with other structures of the same magnitude: Cincinnati bridge, being only 200 feet longer, cost \$1,800,000. The chain suspension bridge at Pesth, Austria, having a mid-span of 666 feet only, cost \$2,700,000. St. Louis railway bridge, having spans of 520 feet, cost \$7,000,000.

The American Bridge Company of Chicago, H. A. Rust, President, presented not only the best plan, but also were among the lowest bidders, and the contract was awarded to them for the whole structure complete. The American Bridge Company transferred the contract for the masonry and the foundations to John Megrew, of Allegheny, who has done his share of the work in the most satisfactory manner, and is right in claiming to have the best job of mason work done along our rivers. The award of the contract to an outside company created quite a feeling among the Pittsburghers, who are right in claiming their superiority in manufacturing of iron work, and it may be quite a satisfaction to them that after all most of the work has been done here, with the exception of the forged link-bars in the anchorages and parts of the iron work, for the manufacture of which the American Bridge Company have special tools in Chicago. Graff, Bennett & Co. furnished the iron in quality unrivaled for the purpose. It is superior in strength and other qualities required for bridge iron to the manufacture of parties making bridge iron their specialty. Mr. Williams, the Superintendent of their mill, deserves great deal of credit for his efforts in obtaining for the unusual large bars a quality of iron in strict conformity with the specifications.

The manufacture of the iron work was done at the Pittsburgh Locomotive Works, under the supervision of the American Bridge Company's agents. The manufacture of the large link-bars was, after some experimenting, brought to perfection so as to insure the same strength throughout the entire bar and even, which before has been only obtained by the process of Mr. Sellers at Edgemere.

On July 1, 1875, work was commenced, and by the following winter the masonry was well advanced. Early in the spring operations were again resumed and continued without interruption to the present date.

The specifications were drawn with considerable minuteness and required very rigid tests for iron. The links were to be made of the best quality of double-refined iron, and in addition to other tests were submitted to a proof strain of ten tons per square inch. sectional area, before they were admitted into the chains. This testing, as well as the inspection of the work and the giving of levels and distances connected with the bridge, in compliance with the specifications, was intrusted to the resident engineer, who was also the estimating engineer.

The records of the iron test have been carefully preserved, and form a valuable record.

The quantities of the material used in the construction of the bridge are as follows, viz.:

"Timber in foundation, 1,442,000 feet, board measure.
"Masonry in anchor walls, 10,868 cubic yards.
"Masonry in piers, 7,507 cubic yards.
"Iron in foundation, 12 tons.
"Wrought iron in superstructure, 2,084 tons.
"Cast iron in superstructure, 52 tons.
"Steel in superstructure, 32 tons.
"Timber in superstructure, 810,000 feet, board measure.
"Number of links in the chain, 1,832."

THE SCRAP HEAP.

Railroad Manufactures.

The Bradley Manufacturing Co., at Syracuse, N. Y., is furnishing its rubber-cushioned helve hammers to the New York Central & Hudson River and the Delaware, Lackawanna & Western, for use in their car shops. The Central already has four of them in use, and the Lackawanna six. The company reports a steady increase in orders and a general improvement in business since Jan. 1.

The new Point Suspension Bridge at Pittsburgh is so far completed that a preliminary test was made on March 31, with very satisfactory results. The new bridge is intended for street travel, has two shore spans iron truss, 145 feet each, and a central span of 800 feet, which is a stiffened chain suspension bridge. It has been designed by the engineers of the American Bridge Co., of Chicago, and built by that company. Its cost has been \$325,000, including the piers and roadway.

The Cambria Iron Co., of Johnstown, Pa., has declared a dividend of 6 per cent.

A new blast furnace, known as the Churchill Furnace, is being built near Logan, O., on the Straitsville Branch of the Columbus & Hocking Valley road.

The Ohio Iron Co. is running its blast furnace and rolling mill at Zanesville, O., steadily, with a full force employed.

The Goderich Foundry Co., at Goderich, Ont., is building 150 dump cars for the Canadian Pacific road.

The Edgar Thomson Steel Works have orders for steel rails for the New York Central and Lake Shore roads.

The New Albany (Ind.) Rolling Mill is working single turn, rolling iron rails.

The Kentucky Rolling Mill, at Louisville, Ky., is running full single turn on merchant bar and light iron rails.

Miller, Jamieson & Co., at Cleveland, O., are building an iron bridge to go to Golden City, Colorado.

A company with a capital of \$100,000 has been organized to build a rolling mill at Canal Dover, Ohio.

The St. Albans (Vt.) Rolling Mill was to start up this week. Some experiments in rolling steel rails are to be made there shortly.

The stockholders of the Joliet (Ill.) Iron & Steel Co. have approved a lease of the works to A. B. Meeker and associates. They are to form a new corporation with a capital stock of \$500,000, and are to pay an annual rental of \$103,000 and one-half the net earnings remaining after deducting the rent and 10 per cent. dividends. The lessees also agree to spend \$15,000 per year for improvements, to pay off the floating debt, and to pay \$75,000 for the company's share in the Bessemer Steel Co., limited. The lease is to run from April 1, 1877, to Dec. 31, 1881.

The Albany & Rensselaer Iron & Steel Co. was to have all its works in operation this week.

The Bethlehem Iron Co.'s steel rail mill, at Bethlehem, Pa., is running on orders from the Lehigh Valley and the Chesapeake & Ohio roads.

The old locomotive works at Lancaster, Pa., have been bought by W. H. Roberts, who intends to convert them into a rolling mill, and to manufacture bar-iron, spikes, bolts, nuts, etc.

The Baldwin Locomotive Works, at Philadelphia, are building an engine for the same road. They have also orders for several engines to go to Brazil.

The Henderson Hydraulic Car Brake Co., of Philadelphia, has made an assignment to George W. Thurston. All creditors will present their claims to the assignee at his office, No. 21 South Third street, Philadelphia.

The Columbus (O.) Rolling Mill has an order for light iron rails for the Wheeling & Lake Erie road.

It is stated that Mr. Willard P. Ward is making spiegelseisen of very good quality at a small furnace owned by him in Bartow County, Ga. The present product is only about two tons per day, but there is a large deposit of ore adjoining the furnace, and operations can readily be extended.

The Pittsburgh & McKeesport Car & Locomotive Works are building a number of cars for the Springhill & Parrsboro road in Nova Scotia.

A Locomotive Boiler Explosion.

On March 8 the boiler of a locomotive on the Chicago & Northwestern road exploded as the train was entering the depot at Sterling, Ill., killing the engineer, fireman, and a bystander. The engine was one rebuilt by the Northwestern Company and had Tilton's corrugated crown-sheet in the firebox. The company requested a number of prominent master mechanics to investigate the matter, and they have submitted the following report, which is signed by R. Wells, Jeffersonville, Madison & Indianapolis; N. E. Champan, Cleveland & Pittsburgh; James Sedgley, Lake Shore & Michigan Southern; James M. Boon, Pittsburgh, Fort Wayne & Chicago; R. Curtis, Pittsburgh, Cincinnati & St. Louis, and S. J. Hayes, Illinois Central, and is addressed to the officers of the Chicago & Northwestern Company:

"We, the committee which have been requested to examine into the cause of the recent explosion of the boiler of engine No. 15 on your road, after careful examination of the same, that the explosion was directly due to the absence of water on the crown sheet. And we believe further, the boiler in all its parts to have been amply strong for the service required had there been sufficient water."

Service of Steel Wheels.

The Boston *Advertiser* of April 2 says: "The locomotive David Tyler of the Boston & Providence Railroad has under its tender a set of German cast-steel wheels, made by Boehm. Each wheel has run 102,002 miles, and shows little or no signs of wear. These wheels were imported in 1872 as an experiment."

Iron Bridge Building in England in 1876.

The annual circular of the firm of Matheson & Grant says: "Bridge-builders and makers of structural wrought-iron work continue busy, and thus maintain the exceptional position, which in the midst of the general depression, they have enjoyed during the past year. The demand for bridges for the Indian State Railways still continues, and large orders have been recently given out. These, with the bridges and roofs for colonial and foreign railways, large span roofs for stations in some of the principal English towns, and the miscellaneous iron work required for the widening and other extensions of English railways, are among the principal works which fill the factories, while the smaller class of structural iron work constantly required by builders in the large towns suffices to employ those makers who do not compete for the more important orders. But while makers in this branch of trade are thus able to obtain orders at rates moderately remunerative, the very low prices of bars and plates have caused a corresponding reduction in the prices of finished work, and purchasers will find this a favorable time for making contracts, if they do not demand from the makers a too great speed in the execution of their orders."

Centennial Awards for Car Wheels.

Among the awards made by the Centennial Judges for car wheels was that to the Cayuga Wheel & Foundry Company, of Waverly, N. Y., for chilled cast-iron car wheels, the official report stating the award in this case to be for "Excellence of material and fine workmanship."

Instructions to Disobey Rules.

According to the *Railway Service Gazette* in England, "an inspector and superintendent were visiting a station to improve the regulation of the traffic, and made a suggestion to the signalman, which he thought dangerous. 'If anything happens,' said he, 'what then?' 'Oh, you must not say we told you,' was the cool reply. The signalman very properly refused to make the alteration without a written order, which they would not give him, and went off. But suppose he had been less vigilant, and an accident had occurred, it is quite evident the blame would have fallen on the wrong person. Meanwhile, another signalman, a few miles off, has been fined £1 for giving 'line clear' before seeing the tail of the train. The public are concerned in seeing all regulations concerning safety duly enforced, but it is not satisfactory to know that sub-officials may be making alterations on their own authority in secret, while the unfortunate men are made to run the risk and also to bear the blame."

How to Pass Long Trains on a Short Siding.

Mr. W. A. L. Farr, of Forks Creek, Col., writes as follows to the *Journal of the Brotherhood of Locomotive Engineers*:

"A has forty cars and engine coming east, B has forty cars and engine going west; they meet at siding C, which will only hold seven cars and engine. They must pass. A and B each having their own cars. A moves on the siding with engine and seven cars, then B comes forward with his whole train on main track west of siding, passing the cars and engine on siding. Now A with his seven cars and engine moves on main track, east, and B backs east through siding with his whole train and eight of A's cars which are left on siding as before, then pulls down main track west of siding, and A backs on to siding and pulls his eight cars out on main track east; this they do four times, B leaving eight cars the second, third, fourth and fifth time, the sixth time there is but one of A's cars to leave, which is left as before. This saves them by, each having their respective train."

New Method of Fastening Boiler Tubes.

The *Engineer* says: "Messrs. Augustus Westwood & Co., of West Brunswick, are now introducing an improvement in tube tubes, which appears to be worth the notice of all who have to do with the construction or working of tubular boilers. The invention consists of cone rings or washers, brazed, soldered or drawn on the end of the tube; the largest diameter of the smallest ring being $\frac{1}{8}$ in. smaller than the small end of the large ring, so allowing the tubes to pass through the first hole with perfect ease; the tubes are then drawn into their places drift fashion, and expanded with an ordinary tube expander. The advantage claimed for the use of these tubes is that the tubes can be taken out and replaced in one hour, for the cleaning and repairing of the boiler, and this may be repeated from eight to twelve times without injury to the tube."

The *Engineer* does not say whether these fastenings can be employed for the tubes of locomotive boilers. If they can be, and what is stated is true, that the tubes can be taken out and replaced in an hour without injury to the tubes, it will be an invention of very great value in some sections of this country where the water is so excessively bad and where incrustation is so great an evil.

Lighter Sleeping Cars.

The Albany (N. Y.) *Journal* says: "Messrs. Gilbert, Bush & Co. are now rebuilding six of the Wagner sleeping-coaches, and will complete them about May. Senator Wagner will not build any new sleeping-cars upon present, or rather old, plans, until new inventions are exhausted in the efforts to overcome the strong objections to the heavy and cumbersome coaches now in use. The controversy with the Pullman Car Company, and the earnest demand of railroad-managers for lighter cars, have prompted Mr. Wagner to make very extensive and careful inquiry into new inventions applicable to sleeping-cars. He has found no less than four new plans, which seem to be prac-

tical for the purposes sought. Three of them are of Eastern invention and one is Western. He proposes the early trial of one of them in a few new coaches, and the application of one of the others in old coaches."

"The Wagner and Pullman sleeping-cars weigh now from 24 to 34 tons. The great dead weight is required on account of the heavy work for the upper berths. The upper portion of the car is necessarily very heavy and strong; this weight, added to that of the berths, makes an excessive load in dead weight. It also tends to make a car rather unsafe by loading the upper portion so much, and renders the strain, under lateral motion, very great and expensive in repairs. The patent which Senator Wagner has now adopted, as best meeting the requirement, does away with the heavy construction of upper works and additional necessary weight. The completed coaches after this will turn the scales at 19 tons or a trifle less. The machinery for upper berths is very simple, portable and light. It is all stowed under the seats or sides of the cars. When the sleeper is made up for the day it presents about the exact appearance of an ordinary drawing-room coach. When it is made up for the night it resembles in essentials the present sleeper, and has the same capacity for passengers and every other accommodation. But it has six or eight tons less dead weight, does not wear the track so severely as the heavy cars, is less liable to upset, the weight being stowed low down near the track. This kind of a car is now in use on some Southern railroads, and its performance is quite satisfactory. It is built at a New England car-shop at present, from which Senator Wagner will order a few cars which he has resolved to use and give the plan a thorough trial, having formed a favorable opinion of it from personal examination."

The First Pullman Cars.

Mr. David Shield, now Superintendent of the Missouri Car & Foundry Co., St. Louis, writes as follows to the *Car-Builders*:

"In a late number of your paper I notice a description of the Barney & Smith Manufacturing Co.'s Works, of Dayton, O., in which it is said that this company were the builders of the first Pullman sleeping-car. This is a mistake that should be corrected; not that I wish to deprive this company of any credit that is justly its due, but merely that the history of the Pullman Palace Car Company may be placed on its proper foundation.

"The first two sleeping cars of the Pullman pattern were built in the shops of the Chicago, Alton & St. Louis Railroad, at Bloomington, Ill., in the fall of 1859, the road then being in the hands of Ex-Governor Matteson of that State. The work was done under the supervision of Wm. Cessford, Master-Mechanic, and David Shield, the Master Car-Builders of the road. These cars were numbered respectively 9 and 19. The next Pullman car was built by Barney & Smith, and numbered 50; and the next by the Wason Company, of Springfield, Mass., and named the Springfield, this being the first car of the class that had a name instead of a number. This last-named car was supposed to be fitted up regardless of expense, and was really, in this respect, ahead of any other car then running. Its cost was \$5,000, which was regarded as an enormous sum to expend upon a railway car. Since then Mr. Pullman has made many improvements, and has spared neither money nor time to make his cars models of elegance and comfort.

"Believing that you desire to place before the public the true origin of this branch of car construction, I have taken the liberty to send you the foregoing statements."

Food for Travelers.

Bayard Taylor, who was unfortunate enough to be snow-bound on a New York Central train for a day or two recently, writes as follows of the fare on which he was compelled to subsist:

"My stomach has accustomed itself readily to the diets of many lands, but it never had a severer task than to keep up a moderate vital force on the basis of pop-corn, peanuts and withered figs. When I think of the cups of invigorating beef tea, the glasses of wholesome beer, the crisp biscuits, split to allow the insertion of a hot-broiled sausage; the appetizing cheese sandwiches, and the delicious pates in their paper nests, which are offered to travelers in Europe, I wish we Americans were less ethereal and more physically sensible in our tastes. The saddest thing about the matter is—there is no protest. The typical American traveler, if he cannot swallow the peanuts, pop-corn and withered figs, remains silent, hungry and cross. He never seems to guess that a vociferous demand for the right things would soon create a supply."

Boots and Coats as Wages.

A recent number of the London *Railway Service Gazette* says: "A complaint comes from the South Devon Branch of the Great Western Railway, and it is one that represents a very serious grievance in winter time and bad weather. The directors of the South Devon line agreed to give their men each two pairs of boots yearly, and faithfully kept their agreement. Now that the men are transferred to the service of the Great Western Company, however, they cannot get their boots. No signs of them are visible, though they are four months overdue, and many of them have had to buy boots, which, considering their wages are in many instances only 17s. per week, is undoubtedly a great hardship. As the company have never denied their obligation, and the inspectors promise to deliver them to the men as soon as received, it is not too much to ask them to remember the old Latin adage which says, 'He gives twice who gives quickly.' A similar grievance exists in quite an opposite direction, only while Devonshire wants boots, Birmingham wants greatcoats! Some men had a claim to new overcoats six months ago—some seven or eight and some even twelve!"

Steel from the Edgar Thomson Works.

The following extract from a letter written by Prof. Richard Akerman, of the Royal Swedish School of Mines, who visited this country during the Centennial, to an officer of the Edgar Thomson Steel Works, gives the result of analysis of six samples of steel from those works, which were made under his direction at the school in Stockholm.

"I hand you the complete analysis of the six samples of Bessemer metal (steel) which you kindly got me. The amounts of carbon have been found out by the Eggertz method, and the results of the analyses which have been made at the School of Mines here are as follows:

SIX SAMPLES STEEL MADE BY THE EDGAR THOMSON STEEL COMPANY, LIMITED.

Steel Marked.	Carbon.	Silicon.	Sulphur.	Phosphorus.	Manganese.	Calcium.
No. 5309.	0.45	0.08	0.09	0.008	0.82	.....
No. 5402.	0.42	0.11	0.05	0.08	0.82	.....
No. 5403.	0.48	0.09	0.06	0.08	0.66	.....
No. 5395.	0.44	0.06	0.04	0.082	0.60	.....
No. 5393.	0.44	0.05	0.04	0.075	0.75	0.008
No. 5394.	0.44	0.05	0.03	0.103	0.66	0.005

"Thus you see that I was entirely wrong to believe that your rails did not contain so much carbon as you said. They contain, on the contrary, still more, and must, no doubt be far better than I presumed."

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Editorial Announcements.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns our own opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to all departments of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

THE PROSPECT OF A RAILROAD WAR.

During the past week the usual indications of a trunk line railroad war have appeared. It is charged that the rates agreed upon under the contract of last December have been cut systematically on east-bound freight, and in that branch of traffic the different lines are now making contracts at their discretion. There is not as yet such a conduct of affairs as can be considered equivalent to a declaration of war, but only the declaration on the part of certain companies that another is pursuing a course which will make it impossible for them to keep the peace. The *casus belli* exists, and war will follow unless such cause is removed. The New York Central, the Erie and the Pennsylvania companies join in charging the Baltimore & Ohio with making contracts for freight from the West to Baltimore at less than the rates agreed upon, and making them, too, in many cases and for large amounts, as if in accordance with general orders from headquarters. So far there has been no answer to the charge made public except Mr. Garrett's statement to a newspaper reporter that his company had "done nothing but what was just and right, leaving it uncertain whether that company denies the charge of cutting rates, or justifies such action by charges of previous violation of the agreement by another party to it. As we write Mr. Garrett is conferring with the other managers, and probably before this paper appears the Baltimore & Ohio's defense, whatever it may be will have been published.

The remarkable feature in this difficulty is that there seems to be no reason for it. All parties to the December agreement have expressed their anxiety to obtain more remunerative rates than heretofore, and none has complained that such agreement has worked to its disadvantage; there has been some disagreement as to the interpretation of part of the agreement; but so far that disagreement has not been assigned as a cause of the present trouble. Thus, no one has seemed to desire the dissolution of the compact, and yet it seems to be going to pieces. Unless Mr. Garrett's hitherto withheld explanation puts a different phase on the matter (as very likely it will), this seems an extraordinary condition of things. Here are the representatives of several hundred millions of capital, all eager to

earn an income on that capital, all suffering from the effects of previous contests, all, so far as appears, tolerably satisfied to work under the agreement which they have made with each other, extremely desirous to avoid the disastrous effects of another railroad war, and yet apparently about to plunge into such a contest, though the simple prospect of such action has already reduced the market value of their companies' securities by some millions of dollars.

We say apparently, for though there is every sign of a contest at present, the Baltimore & Ohio has not been heard from, the first conference with its representative has not been concluded, and it is not impossible that the issue may be a more perfect agreement instead of the war to the knife which seems to be generally apprehended at present by those most intimately acquainted with the facts.

The anticipation of trouble has already had an effect on stocks, as the following quotations for different dates will show:

	1877	1876
New York Central.	101 1/2	97 1/2
Erie, common.	9 1/2	5 1/2
Pennsylvania.	97 1/2	78 1/2
Baltimore & Ohio.	154 1/2	138
Michigan Central.	46 1/2	43
Lake Shore & Michigan R.	56 1/2	50 1/2

If we compare the figures in the last two columns, we will see the changes made within a twelve-month. The values have decreased as follows: New York Central, 19 per cent.; Pennsylvania, 31 per cent.; Baltimore & Ohio, 28 1/2 per cent. The Erie stock, which has special causes for depreciation besides the general causes affecting the other trunk lines, is worth 72 per cent. less than a year ago. Of the two western stocks, Lake Shore has gone down 25 per cent. and Michigan Central 37. These are enormous changes, and they come after a year of the heaviest traffic these roads have ever had, and at a time when the prospect for future traffic is good, the staples which go to make up the bulk of the freight business being plentiful and the prices remunerative. All the roads named, moreover, have paid dividends as usual of late down to the present time. The only sufficient cause of the great depression in prices, then, seems to be the belief that remunerative rates will not be secured, that there will be a railroad war again this season and that such contests must be counted as probabilities rather than possibilities at frequent intervals in the future.

Doubtless, a protracted railroad war this year is likely to have a very serious effect. It would come after two other struggles of unparalleled severity, which have weakened the strongest of the companies, though last year there were some compensations for the reduced rates due to the extraordinary passenger traffic. But this year there is no such resource. Inevitably, passenger traffic on the trunk lines will be light. A very large part of the important traffic of visitors between the East and the West, and of most other travel which is not necessarily done within the year, was concentrated in the Centennial year. Freight traffic is not likely to be much different from last year's (when it was the largest ever known) unless rates are different; and if rates are lower, the losses of the railroads will be only increased. We do not believe that any trunk line company is prepared to meet such a trial as that of last year without incurring a reduction of dividends for the dividend-paying roads, and something more serious, perhaps, in the case of those which pay no dividends. Indeed, it is the latter which suffer the most in the railroad wars. The lines which form the second section of the trunk—those west of Buffalo and Pittsburgh and Wheeling—have not that enormous local traffic which of itself affords so strong a support to the Pennsylvania and the New York Central and other trunk lines. Compel the Great Western of Canada, the Michigan Central, the Atlantic & Great Western and similar lines to carry all their through traffic for less than cost, and you limit their income seriously, as some of the bondholders as well as the stockholders have already found out.

In all probability stockholders in the several companies will exercise all the pressure they can to prevent a conflict. The man who had \$10,000 worth of Baltimore & Ohio stock and \$10,000 of Pennsylvania stock a year ago now finds the former worth \$2,850 and the latter \$3,100 less, and all or nearly all apparently because the trunk lines cannot keep the peace. All such investors are likely to require their agents, the managers, to show satisfactorily that they have not lightly entered upon a disastrous contest.

So far as appears, the agreement as to the basis of rates made last December has not had any important effect on traffic. It has not been in force long enough to justify a final conclusion, which could not be arrived at without experience when navigation is open as well as when it is closed. Traffic has been quite light most of the time since the agreement was made, and so far as export traffic is concerned the decrease in traffic has not been wholly due to the increase in railroad rates, for that increase was accompanied by a material decrease in ocean rates. Early in December, when the railroads were carrying wheat from Chicago to New York for 12 cents a bushel, the steamers got 16 cents for carrying it from New York to Liverpool.

Most of the time since December, while the rail rate was increased to 24 cents a bushel, with a drawback on exports, the ocean rate has been but eight or nine cents, so that the cost of exporting grain from the Northwest to England has been very nearly as low during the past winter as it was with the extraordinarily low rates of last summer and fall—a notable fact. The grain movement has not been very heavy, however—only about equal to the average of the three previous years. The distribution has not been very different from last year's, and seems not to have varied greatly at different periods in the winter.

For the first nine weeks of the year New York received 27.5 per cent of the total receipts of grain at Atlantic ports; for the three following weeks, 30.6 per cent. Baltimore and Philadelphia together received 49.2 per cent. during the first nine and 48.1 per cent. during the following three weeks. New York thus gained and the other two markets lost just as much as it gained, the three together receiving 76.7 per cent. of the total in both periods. The proportions for the different ports were:

	1877	1876
9 weeks.	3 weeks.	9 weeks.
Jan. 1 to March 3.	March 4 to 24	3 weeks.
New York.	27.5	31.0
Boston.	15.8	7.5
Portland.	2.0	3.0
Montreal.	0.3	1.2
Philadelphia.	16.7	22.0
Baltimore.	32.5	20.0
New Orleans.	5.2	7.3
Total.	100.0	100.0

From this it appears that of the three rival markets, New York, Philadelphia and Baltimore, the latter alone had a falling off this year in its proportion of receipts in March compared with the months of January and February. And compared with last year's movement, there are no notable changes in the receipts of the three leading ports.

If there has been any undue advantage in rates in favor of Baltimore, as charged, it would not be likely to appear in the receipts for the period named above, but in those of the following weeks.

The occurrence of a difficulty of this kind, without any apparent cause in an undue diversion of traffic, has doubtless led the community to suspect that there can be no permanent harmony among the companies; and it will probably incline many who study the question to doubt the success of any plan for maintaining rates which does not provide some means by which the different parties to it know what each other is doing—some clearing-house, or similar organization which will account for all business done under the agreement. The companies are so suspicious of each other, the methods of soliciting business have been developed in such a way, the examples of deception and underhanded dealing have been so numerous, that a lack of confidence is likely to destroy the usefulness of any plan which depends upon the agents of the individual companies for its execution. Perhaps, after a few more disastrous conflicts, the present companies (or their successors) will be willing to adopt some really effective checks on each other. Perhaps, too, they will do it sooner, without even one more war. The condition of things in such that we may expect anything—a closer combination as well as a war of extermination.

Inventorying Railroad Property.

Not the least of prerequisites to the conduct of business of the slightest complexity is a knowledge of the number, nature and quality of the instruments by which the business is done. The man charged with "running the machine," whether the machine be a literal or a metaphorical one, needs to know what the machine is—how large it is, what its parts are, the condition of each, at least so far as affects the capacity and durability of the whole. Next to a Government, probably a great railroad is the most complex of human machines; and it cannot be run, any more than others, with the maximum effect unless its manager, the man who "runs" it, knows what it is minutely enough to judge as to what work it can do as it is, what it is likely to need in the near future in order that its capacity may be maintained, and (which in some cases is of vital importance) what is needed to increase the capacity of the whole or one of its parts.

To have any effective check upon the subordinates in charge of any of the company's property, there must be a quite minute record of this property, especially of that which is rapidly consumed—the ordinary "working supplies" of the railroad. A man is expected to make the best use of the materials furnished him, but we can never even guess whether he does so, unless we know what he has had, and keep up the knowledge.

If the railroad's business has been properly conducted from the beginning, there is not a great deal of difficulty about this. An account is kept of everything put into each man's charge, and he can be held responsible for it, and when he makes requisitions for additional material he can be required to report as to the disposition of that previously received and of the condition of what remains in his charge, and a check on his reports can be had by inspections, more or less frequent and vigorous, according to circumstances. The knowledge that his superiors know exactly what has gone into his hands, and will be sure to test his report as to its disposition and condition, will be likely to make him circumspect.

If, however, there has been one interval in this exact accounting, its resumption will by no means restore the needed checks. We may know exactly what our administration has issued to its agents from its stores and purchases, but we can

not say whether they have used these issues economically until we ascertain what was in their hands at the beginning of our administration. This knowledge can be had only by means of an inventory.

When a railroad company becomes involved and its property passes into the hands of a receiver, to be managed by him to the best advantage for the benefit of whomsoever the court shall finally decide, an inventory is required for the benefit of all parties. The receiver must be held responsible for what he "receives," but nothing more; and at such a time, when the future disposition of the property is to be decided upon, this exact knowledge of what the property actually is often becomes of the very first importance to its proprietors. The railroad for some reason has failed to pay its debts, usually has failed to earn enough for that purpose. Among the reasons assigned for this failure may be its condition—its lack of appliances necessary to the economical conduct of its business; or the bad condition of such appliances, requiring extraordinary expenditures for repairs and renewals; and the proprietors need to know the facts, not only to enable them to judge of the efficiency of their agents in the past, but especially as a basis for a reorganization of the corporation. Otherwise they may begin their new career in a crippled condition, failing to provide the new capital by which alone their property, however costly it may be, can earn an income on its cost; or they may reorganize with too large a funded debt, insuring a second bankruptcy at an early day; or they may provide capital in excess of the actual needs, which is not only needless but often dangerous.

In the case of the Erie Railway, there was an accumulation of reasons for calling for the "true, full and complete inventory" which the Court ordered. Its career had been so checkered, its managements so various and the changes in them so sudden and violent that it was to be expected that no complete record of the details of the property as originally acquired would be preserved, to say nothing of its condition, which must have changed radically in many respects during the many years of its existence. It had been the subject of controversy many years; it was one of the most complex of properties on earth, holding all kinds of railroad (and much other) property by all kinds of titles, and some probably by no title at all; there were the most various opinions as to its value, but the most sanguine of its managers had urged the need of the expenditure of some millions to improve it as a preliminary to its profitable working. A reorganization was inevitable, and it was of the first importance to provide in it, first, for such new capital as should be required to put the property into thoroughly effective condition, and second, to limit the yearly fixed charge for interest to what the property would be able to earn even under adverse circumstances. And the experience of the proprietors had made them unusually distrustful, and especially loath to increase their investments in the property without the most positive evidence of the need of the additional capital. It, therefore, was especially desirable that the inventory should be something more than a formal list of so many cars and locomotives and miles of track, that it should give a true account of the property and its condition in all its parts and details.

The Receiver seems to have appreciated this fact, and under his orders an inventory has been taken, covering some 12,000 pages and forming 19 folio volumes, which, judging by the forms by means of which it was taken and the instructions thereon, must really be a "true, full and complete" description of the enormous and various property of this unfortunate corporation, and doubtless the most comprehensive, complete and accurate inventory of such a property ever made in this country.

The work of inventorying was committed to Col. G. T. Balch, whose little work on the classification of railroad property* was reviewed in the *Railroad Gazette* of September 11, 1875, and welcomed as a recorded step in the direction of a more careful study of the problems of railroad organization and administration. We now receive from him the comprehensive series of blank forms, the plan of which was indicated in the preface of this little book, which were designed and used by him for taking and compiling the vast inventory of the Erie Railway above referred to, the bulk of which is a feature likely to strike the most casual observer. More bulk, however, is a very uncertain test of merit, and may exist without accuracy, usefulness, or even completeness. In this case, we have, as a basis for a judgment of the work done, the system and instructions by which it was done; for these blanks are that system and contain those instructions; and if they have been followed in making the inventory, then it must contain a completer account of a complicated property than ever was made before, probably. In the preface to his book, Colonel Balch lays stress on the fact that the value of an inventory depends upon its *completeness* and *accuracy*, and that the methods pursued, both in the enumeration of the property and in the collation of the record of that enumeration, must be such as to produce these results, in order to inspire confidence in the statements of values predicated upon such enumeration, which are the ultimate and real objects of the work. This seems to have been kept in view in the preparation of the system shown by these blank forms. They are designed to provide a practical plan by which the exact values of a railroad property can be accurately ascertained, whose methods are based upon an exhaustive analysis of the subject, supplemented by thoroughness of detail and honesty of purpose, and whose summaries of results are vouched for by a record as intelligible to the layman as to the technical expert.

This plan of procedure we understand to have been followed in the work of compiling the Erie inventory. The enumeration of the property in question has been mainly executed under the direction of Colonel Balch in accordance with the methods

marked out in the preface of his book; in the record for the Court the classification proposed has been carefully observed, while the manuscript has been prepared upon the blank forms, specimens of which are now before us.

Few persons not directly connected with the highest executive offices of railroad service, or who have not made the organization and administration of that service a subject of special investigation, have any very clear idea of the magnitude of the undertaking consequent upon an order for a "true, full and complete" inventory of the property of a railroad corporation, using the term property in its widest sense. Where an inventory is called for in any ordinary commercial or manufacturing business, the merchandise or machinery to be taken up embraces at most but few classes or kinds, the property is usually stored under one roof or in one neighborhood, is in the personal charge of the owner or owners, who from the nature of their occupation must necessarily be more or less familiar with the condition of the articles to be described; and hence, as the interests involved are limited to a few persons, a simple record giving the name and quantity of each article on hand, together with its market value, is all that is required. Even where the property is in the form of real estate, the parcels to be described are few in number compared to what a railroad company possesses, the parties interested are usually familiar with its location and extent, and as the record is not to be used beyond a narrow circle, there is no occasion for much detail. But with the property of a railroad corporation, particularly if it be a railroad system rather than a railroad line, with tracks threading several States, perhaps, extending over a thousand miles or more of territory, the case is widely different, and can only be paralleled by the possessions of a government.

No individual, copartnership or corporation possesses such a variety and amount of property in both its forms of real and personal estate as is owned or controlled by such a company at the present day. Its right of way acquired from thousands of grantors, stretching in an unbroken line between the most distant termini of its road, carries an artificial highway constructed with great labor and expense, and studded with engineering works various in nature, design and cost, over which a ceaseless tide of merchandise and travel ebbs and flows between its hundreds of stations.

A "true, full and complete" inventory of such possessions means nothing less than an accurate record of the location and value of each piece of land held by whatever title; a statement of condition and value of each bulkhead, dock, pier, earth-work, culvert, bridge, retaining wall and tunnel; an account of the rails, cross ties, fastenings, switches and crossings; an enumeration of the appliances for coaling, wooding and watering locomotive engines and for turning and transferring engines and cars in all the details of platforms, pockets, yards, sheds, dams, reservoirs, piping, tanks, tubs, wells, cranes, turn and transfer tables and hydraulic hoists; a record which shall take cognizance of the miles of fences, the boundary posts and monuments, the complex system of signals and the telegraph appurtenances which line the roadway; of the bars, gates, signs and planking at grade crossings and of the ash-pits, bumpers, scotches, track scales, gas and water mains, drains and sewers at stations and yards; which gives the age, details of construction, condition and value of buildings at stations, aggregating thousands, and embracing those for the passenger, express or telegraph service, for the storage or transfer of freight for special traffic, such as that in coal, grain, live stock, milk or oil, for housing engines and supplying them with sand and water; for constructing, repairing and cleaning engines and rolling stock, comprehending the entire range of shops used by the motive power and machinery services, and lastly such as are used only for dwellings or offices.

The inventory would be far from complete, however, were we to omit the property technically known as "appendages and enclosures," such as gravel pits and the various rights which are indispensable to operate the road successfully, or if we should overlook that group of possessions not strictly appertaining to the way and works, such as horse railroads, ferries, mines, water fronts and similar realties directly or indirectly connected with the general interests of the company, which it controls by virtue of the ownership of the capital stock of the corporations in which the title to these properties is vested. But if the details of the real estate are thus complex what shall we say to those of the personal property, embracing as it does the cash assets and evidences of indebtedness of individuals and corporations in all their multifarious forms as shown by the books of the company; the means of transportation by land and water, as cars for passengers and freight in all their great variety and the ferryboats, steamers, tugs, barges and floats; the locomotive engines, often comprising many types of construction, with their tools and supplies; the tools and machinery for working metal and wood in all their forms; those for special processes incidental to the railway service, such as gas-making, waste-washing, oil-refining and sand-drying; the thousands of forms of tools required to meet the wants of blacksmiths, bridge-builders, boiler-makers, car and engine builders and repairers, coppersmiths, carpenters, gas, steam and water fitters, machinists, moulderers, oil-refiners, painters, pattern-makers, tinsmiths and roofers, tracklayers, teamsters and upholsterers; the machinery used for special purposes on land or water, as derricks, steam shovels, dredging machines, land and floating pile-drivers; the patterns for castings, often numbered by thousands, but the individuality of each of which must be preserved; the office supplies, such as the blank forms, tickets, blank books, stationery, etc., the value of which on such a road as the Erie may alone amount to from one to two hundred thousand dollars; the furniture and the apparatus for illumination, heating and extinguishing fires at stations. Each article in all these groups and those embraced in many more, which it would be tiresome to enumerate, it must be borne in mind, are in all grades of condition and wear, and are used or stored at hundreds of points in the care of an army of employees

who have no pecuniary interest whatever in the property in their charge and for which they are held responsible.

Finally, as still more forcibly illustrating the difference between an inventory of railroad property and that of the property of an individual or a firm, the proprietorship of all this vast estate, instead of being held by a single person, or a copartnership, is vested in a large body of stockholders, most of whom can give no personal attention to the details of the company's business, and all of whom are dependent for any knowledge as to how the trust is administered by their servants, or how their interests are conserved, upon such statutory reports as the laws of the State or the company's charter make obligatory, or such special ones as an extraordinary occasion may demand.

Such, then, being the property of a great railroad corporation, the question which naturally arises is, how shall this great mass of apparently incongruous assets be separated into a few general groups, these groups classified, and their elements individually described and valued so that the average stock or bondholder, who has neither the training, time nor inclination to digest the perplexing details of such work, can at once reach the final results, and, finding, implicitly accept them as true?

This is the task which Colonel Balch two years ago set himself to accomplish. The end was to be reached by no royal road; it demanded careful preparation and study, well-digested plans and an inexhaustible stock of patience and perseverance; but his previous experience in the army had prepared him for such a task. It was under his instructions and in accordance with his methods that the clerical service of the Ordnance Bureau of the War Department was reorganized in 1862 and 1863, and it was at the same time that he prepared for and introduced into the army the series of printed blank forms for the rendition of the accounts of ordnance property by all arms of the service, which have been continued in use up to the present day.

The work he thus marked out for himself in connection with railroad property may be said to have consisted of two parts; first the classification of the property, the designing of the blanks, and the preparation of the instructions for the inventory—that is making the plan for taking the inventory; and second the actual inventorying and the compilation of the results. Neither is an easy or simple task, but the first is general in its nature, and once done thoroughly is done for railroad property everywhere, as well as for a single company. The value of Colonel Balch's work to the railroad community at large is in this first work, which he has wrought out so elaborately and systematically that it may be applied to any railroad; and it thus forms an important and ever available contribution to the art of railroad administration.

There are two essential features in such a system as is here contemplated.

First. There must be a complete classification of the entire property capable of being adjusted to meet the requirements of any plan of organization.

Second. There must be a uniform method of enumerating, describing and valuing every item of property embraced in the classification adopted.

The germ of the first feature we have in the work published by Colonel Balch in 1875. We say the germ, because we are informed by the author that he has in preparation for the press a much more complete classification, which will embody the results of his experience in connection with the Erie inventory.

We have, however, in the indices of the "Franchises and Grants," the "Real Estate and the Personal Property" of the Erie Railway, which form a part of the series of the blank forms before us, a most complete classification of that property, and doubtless the most complete outline in brief of railway property at present accessible in our language.

Touching the second essential feature, we propose to make the forms which it embraces the subject of a future article.

Foreign Railroad Notes.

A writer in a German railroad paper in a series of able articles complains that a great deal of the expense incurred on railroads has no justifiable economical result—that is, costs more than it comes to when the general good of the community is considered; and he says that this is largely due to unreasonable requirements for certain comforts and conveniences which are readily perceived, but the cost of which prevents the attainment of other objects of very much greater importance. This is especially true of passenger traffic, which has been made more and more costly by the provision of various things which add to the comfort or convenience of passengers, perhaps, but do so at the expense of the national industries. He says that in 1864 on seven out of the eight Prussian State railroads the passenger expenses were greater than the passenger receipts, and on the eight together, the passenger expenses were more than a million dollars greater than the passenger receipts—which million dollars was thus virtually assessed upon the freight traffic. Freight rates, he says, might be considerably reduced if passenger traffic were made to pay a reasonable proportion of the interest on railroad investments; and he would have it made profitable, not by raising the rates, but by reducing the expenses—lessening the number of trains, providing for a large part of the short-trip traffic by freight trains, reducing the number of classes from four to two—a "cushion class" and a "wooden-bench class," he would call them. As an example of needless trains he cites a special fast train on a North German railroad about 38 miles long, which forms a section of a through line in competition with another road. This train has been maintained for several years, though it usually had but 30 to 40 passengers. The reason given was the importance of providing for the through traffic. After the train had run for years it was found that the average number of the through passengers had been one and two-thirds per train! The statistics indicate that an additional expenditure of about \$25,000 a year had been incurred for 3½

* A GENERAL CLASSIFICATION OF RAILWAY REALITIES, RIGHTS AND PLANT, designed to facilitate the work of taking an accurate inventory of such property. Applied to the property of the Erie Railway Company by George T. Balch, C. E., late Brevet Lieutenant-Colonel Ordnance Dept., U. S. A. New York: Lange, Little & Co. 1875.

persons per day, or \$18 per trip of 38 miles. We fear that there are many similar cases on this side of the Atlantic, though those who keep the trains running probably labor under the delusion that they are making money by them.

The organ of the German Empire says that on the first of October last year there were 1,669 different tariffs on the German railroads, excluding those of Bavaria, 1,173 of which were for freight. There were 51 "special tariffs" for grain, and 237 for coal. This will all be changed by the uniform tariff system proposed by a convention of the private railroad companies, and now needing but one or two formal steps to be adopted for all the railroads of the Empire.

The Belgian *Moniteur des Intérêts Matériels* of Jan. 7, in an article on some financial relations of the State Railroads, says: "It is no mystery to any one that the financial situation of the State Railroads is difficult, and that the profits of these roads no longer suffice to pay interest on the capital employed in constructing or purchasing them. * * There is one remedy which probably it will not be possible to avoid. The State cannot carry at a loss, and nevertheless that is what it is doing to-day. The raising of rates alone would make the position sound." In a second article on the same subject it says: "That the State carries at a loss is easy to demonstrate." It then shows that the State's investment in railroads at the end of 1875 amounted to about 500,000,000 francs, and that the income from this investment was 19,000,000 francs, or at the rate of 3.8 per cent., which is much less than the State has to pay for interest on capital.

About the 1st of January a contract was let in Belgium for the construction of 25 locomotives without tenders, of a standard pattern adopted by the State Railroads, weighing 66,000 lbs. each. The price accepted by two works was 1½ francs per kilogram, which amounts to 45,000 francs each, or about \$8,730 gold. This is quoted as low without precedent and between 15 and 16 per cent. lower than the price given only a month before for a lot of 85 similar locomotives.

The Belgian State Railroads still have their rails made only 20 feet long, while in most other European countries for some years they are made 6 to 10 feet longer. A French company has just ordered a lot 39 ft. 4½ in. (12 metres) long, for trial.

Van den Kerchove, of Ghent, Belgium, who had a beautiful Corliss engine at the Centennial exhibition, has received an order for two just like it, each of 1,000 horse-power, for Belgium.

At a meeting of an association of railroad men in Berlin Feb. 20, Lieut.-Col. Golz spoke on the railroads of the United States. He said that the lack of legal restrictions as to the construction of railroads and of an inspecting and supervising power had tended to an extraordinarily rapid extension of railroads. While the power of directors was almost unlimited and had led to great arbitrariness, on the other hand they prosecute their business with extraordinary zeal and energy and great mercantile skill, and do not require a costly administrative staff. The traffic on American roads seemed to be no greater than that on those of the Continent. The speed of trains was the same as on German roads. The responsibility of the railroads for injuries to persons is strict. The speaker described at length the method of surveying practiced in America, and the details of the construction of the roads, mentioning especially the bridge construction, the rail joints, the construction of switches (illustrated by a model of the Wharton switch), the signal system and the station arrangements. The characteristic features of the rolling stock were declared to be, the use of trucks under cars, and the central buffer, instead of the two-side buffers universal in Europe. The composition of trains-crews was the same as in Germany. Switching was done with the same appliances but with less caution and with the greatest rapidity. In the report which we see Lieut.-Col. Golz's opinions on the value of our methods are not given.

An Austrian railroad company (the Austrian Southern) has recently made a most elaborate report, from which some items of interest to Americans may be gleaned. The average train load was 220 tons of 2,000 lbs. in 1875, having increased from 195 tons in 1867. The locomotive expenses per train mile increased in almost exactly the same proportion, leaving the cost per ton per mile almost exactly the same in the two years, and equivalent to 0.17 cent., or 21.2 cents per train mile in the latter year.

In passenger traffic, an average of 18,515 lbs. of car was hauled to every passenger, and in freight traffic 1.35 tons of car to one ton of freight. The heaviest locomotives used have eight wheels connected, with a load of 28,500 lbs. per axle. The box freight cars used weigh mostly 11,000 lbs., and the heaviest of them, having a brake and iron stringers, do not exceed 13,300 lbs., with a capacity for 22,000 lbs. of load. The company claims that its freight cars are the lightest in Austria, and it has made special efforts to reduce dead weight.

In France in 1875, the average receipt per ton per mile on the Northern Railroad was 2.16 cents; on different lines of the Southern Railroad, it varied from 2.03 to 2.29 cents; on the "new system" (secondary roads) of the Paris, Lyons & Mediterranean, it was about 1.80 cents; and on the old system of the Orleans Railroad, about 1.80, the average haul being 118 miles. These are about the rates of the railroads from Chicago westward and about twice as much as the trunk lines got last year.

Technical Conventions.

Annual conventions of railroad and engineering associations will be held as follows:

The Car-Accountants' Association, at Indianapolis, Wednesday, April 18.

The American Society of Civil Engineers, at New Orleans, Tuesday, April 24.

The American Railway Master Mechanics' Association, at St. Louis, Tuesday, May 15.

The Master Car-Builders' Association, at Cleveland, Wednesday, June 12.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

Columbia & Port Deposit.—Completed by laying 4 miles of track between Conowingo and Peach Bottom, Pa.

Cincinnati & Eastern.—Extended from Batavia, O., eastward to Williamsburg, 9 miles. It is of 3 ft. gauge.

Eureka Iron Co.—This company has completed a road from Standiford, Ala., to the Eureka ore bed, 1½ miles. It is of 5 ft. gauge.

Texas Western.—Extended from Wimberly, Tex., west to Pattison, 11 miles. It is of 3 ft. gauge.

This is a total of 25½ miles of new railroad.

The READING RAILROAD COMPANY seems to agree with *The Nation* that the Brotherhood of Locomotive Engineers "has got to be broken up," for it has given notice that its engineers cannot remain in its service and in the Brotherhood too. It promises to provide a satisfactory substitute for the life insurance and assistance features of the Brotherhood, however. It seems to be taken for granted that these are the only sufficient reasons for the existence of the Brotherhood. But the life insurance society of the Brotherhood is a separate organization, we believe, established later, to which not all members of the Brotherhood belong, though they alone have the privilege of insuring in it. There are, of course, social attractions in such an organization; and it doubtless has tended to give the men a strong class feeling, and a commendable pride in their occupation and a commendable desire to keep disreputable men out of it. On the other hand, members of such an organization, when it includes the greater number of capable and trustworthy men in the calling, are very likely to assume and act on the assumption that the organization includes all capable men in the business, and that no one outside of it is fit to be trusted with their work. This is a feeling, however, which extends to nearly all people, of every degree. The quality of the Brotherhood which the railroads object to is its striking power—which, as we maintain, is a legitimate power of any body of employees, though of course it is possible for an organization habitually to use that power so recklessly as to deserve the enmity of the employers in particular and the community in general. That is, while admitting the legitimacy of a union of men for the purpose of striking, it might be considered just and politic to endeavor to destroy some given organization, because of its improper, arbitrary, reckless or criminal use of that legitimate power. But it cannot be expected that enginemen or any other men will remain permanently entirely at the mercy of their employers as regards their wages, hours of service, etc. They will be sure to combine when they have a grievance, or are convinced that they have; and no plan for doing away with an existing organization will be satisfactory and sufficient unless it provides a substitute for the striking power, as well as for life insurance and the like. To do away with strikes we must have a substitute for strikes—some means by which the objects aimed at by strikes may be attained. If the Reading Company provides such a substitute, it will do one of the most valuable works of the century; if it simply detaches its enginemen from the present Brotherhood, without affording them any means for settling questions which may arise between the men and the company, its success can hardly have a permanent value.

THE BLOCK SYSTEM seems to cost something in England, where, however, it is generally regarded as almost indispensable on roads with a heavy traffic. The Great Northern Company, which has nearly 600 miles of line, has made the following expenditures in connection with the block-telegraph system and interlocking apparatus during the past seven years:

1870	\$5,750	1875	\$455,930
1871	41,210	1876	380,235
1872	36,936		
1873	89,326	Total	\$1,388,620
1874	379,236		

This makes the total expenditure for the appliances of the system at the rate of about \$2,370 per mile of road; and whether it is fully introduced throughout the company's system does not appear, but probably it is not, for some parts of the line probably have not so heavy a traffic as to require it. The above amounts are simply the capital invested in the improvements. Last year there was an expenditure for maintenance and renewals amounting to \$31,130, and one for additional signalmen amounting to \$127,150. If we reckon 7 per cent. interest on the capital invested (5 per cent. is sufficient there, but 7 is none too much for the average American company), we have a total annual expenditure chargeable to the improvements of \$255,480, or \$437 per mile of road. We see no estimate, however, of the economy effected by the use of the block system; and there must be some considerable savings which should be set against the above expenses. Indeed, as some lines and sections of lines are so crowded that they could not be worked without the block system, we should set against its cost on those sections the cost of interest and maintenance for the additional tracks which otherwise would be necessary. It is said that on the London & Northwestern, which has now more than 1,000 miles worked on the absolute block system, the additional cost of the new over the old system is between \$1,000,000 and \$1,500,000 per year.

THE BRITISH RAILWAY COMMISSION has been spoken of recently as exercising power over railroad companies such as would hardly be proposed in this country, and such as would be extremely distasteful to American companies. This is likely to give an erroneous opinion of this body, which certainly has extensive powers, but is so organized and exercises its powers in such a way that we believe that some American companies have contemplated recommending it as a substitute for the regulating laws under which they work. The British Commission is a court which tries cases, and decides after hearing evidence and arguments, and states the grounds of its decisions. By law one of its members must be an expert in railroad manage-

ment. There is no doubt, we suppose, that the railroad companies would prefer to do as they please; but they have to work subject to the laws everywhere, and they are less likely to suffer injustice from a court which is familiar with transportation business than from one which is not. It is true, however, that the Commission practically adjudicates many cases which would rarely come before an ordinary court, and would be decided against the patrons of the railroads if they did, simply because of the acknowledged inability of the court to deal with them. Take, for instance, the case of complaints of "unreasonable charges." In the suits under Granger laws the railroads generally acknowledged that they were bound to carry at "reasonable rates," and that for any extortion they were liable; but they claimed that the "extortion" or "undue discrimination" must be proved before the courts. Now the cases are very few in which any ordinary court, after ever so much evidence and argument, would feel able to decide whether a given rate was reasonable or unreasonable. But an expert court like the British Railway Commission decides such questions and others like them much more promptly than ordinary suits are decided in the regular law courts. Recently the chief business before the Commission seems to have been disputes between railroad companies, which it seems admirably fitted to try. The British Commission is likely, in time, by its decisions, to form a body of *quasi* laws regarding the duties and privileges of common carriers, which will be of great interest and value in all countries.

A "SOLUTION OF THE RAPID TRANSIT PROBLEM" is announced every now and then, when some one has invented a new street car motor, or puts a little engine on a street railroad, to which, if successful, great praise would be justly due for a prospective economy in working or increased comfort to passengers. It seems to be forgotten that the main obstacle to rapid transit on the surface of the streets is the objection to the speed itself. Horses can travel much faster than they actually do on the streets, but it is dangerous for them to go at full speed, and the laws prohibit it. The street cars now, we believe, are propelled as fast as the laws allow. A greater speed would be dangerous, whether effected by steam or by horses. No possible improvement in the motive power of street railroads can materially increase the practicable speed of the cars running on them. What is to be hoped from the substitutes for horses is that they may make it practicable to haul cars cheaper, to take two, perhaps, when the movement is active, without increase of employees, and so give every one a seat, to haul larger cars perhaps, or heavier ones, containing some heating apparatus in cold weather, and generally to make this method of travel comfortable—not fast. Of course where a horse railroad extends beyond the city into the country, speed becomes practicable on that part of its line; but there has never been much difficulty about suburban lines. It is for city streets that "rapid transit" is required.

A PROVIDENT FUND for railroad employees is described in the part of M. Jacqmin's chapter on French railroad employees, which we publish this week, including the manner in which the fund is created, its disposition, and the working of the fund for a series of years. Other policies by which French companies seek to improve the condition of their men, and attach them to their places, are described in the same article. There remains the pension fund, an account of which is given in the part of the translation to be published next week. Americans may smile at the paternal care exercised by the French company over its employees, and there is no doubt that some of the things which it does would be distasteful to American employers and employees alike; but on the other hand there is much which will command itself to railroad service in this country, as likely to be useful to both parties, and to tend to make the employment more desirable and the employees more efficient.

AN INTERNATIONAL INTERCHANGE OF CARS has recently been agreed upon between the French, the Belgian, the Dutch and the leading German railroads, with regulations for the same. It seems that the French and Belgian roads have had to give up their whole system of car-accounting in order to accomplish this, and to adopt mainly the German system. As there is an enormous interchange of traffic, it is hard to believe that the interchange of cars is anything new.

THE PENINSULA & ORIENTAL STEAM COMPANY, the greatest steam navigation company in the world, has a capital per ton of vessel owned of \$122 gold—though but eight years ago this capital was \$150 per ton.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Louisville & Nashville.—Mr. Wm. W. Thompson, Paymaster, has been appointed Cashier also, the two offices having been united.

Lake Erie & Louisville.—The bondholders who bought this road at the recent sale met last week and organized new company by electing the following directors: W. H. Andrews, L. H. Burgoon, B. B. H. Miller, C. O. Tillotson, Fremont, O.; Hon. Charles Foster, Fostoria, O.; C. S. Brice, Lima, O.; A. B. Williams, Cincinnati; Herman R. Baltzer, A. Hegewisch, James B. Hodgskin, Adrian Iselin, Jr., E. Livingston, C. W. Taylor, New York. The board elected James B. Hodgskin, President; Hon. Charles Foster, Vice-President; W. H. Andrews, Secretary and Treasurer; C. S. Brice, Attorney; L. H. Burgoon, General Superintendent. Mr. Burgoon has had the management of the road as Superintendent or Receiver for a long time.

Emerson & Shippensburg.—At the annual meeting at Emerson, Pa., March 30, the following directors were chosen: Jas. Bennett, Chas. W. Mackey, J. M. Dickey, J. W. Rowland, Henry Wetter, Jacob Black, P. F. Kribbs, Marcus Hulings, Wm. J. McConnell. The board elected James Bennett President; J. M. Dickey, Vice-President; J. W. Rowland, Secretary and Treasurer; Charles W. Mackey, Solicitor; J. V. Patton, Superintendent.

Chicago & Alton.—At the annual meeting in Chicago, April 2, the three directors whose terms have expired were re-elected.

ed, as follows: T. B. Blackstone, John B. Drake, Chicago; D. Willis James, New York. The board re-elected T. B. Blackstone President; W. M. Larrabee, Secretary and Treasurer.

Boston, Barre & Gardner.—Mr. George S. Wright has been appointed General Ticket Agent, in place of J. C. Spaulding, resigned.

Troy & Boston.—Mr. Z. B. Davis is appointed Master Mechanic, in place of Foster Church, resigned.

Lake Shore & Michigan Southern.—Mr. Leverett H. Clarke, for many years past Chief Engineer of the Illinois Central Railroad, has been appointed Chief Engineer of the Lake Shore & Michigan Southern Railway, to succeed the late Charles Collins. Mr. Clarke enters upon his duties on the Lake Shore May 1 next.

Cincinnati, Indianapolis & Cleveland.—The Ohio Circuit Court has appointed James Lea Receiver in a suit begun by Rush R. Sloane. The Receiver has appointed Rush R. Sloane General Manager.

Syracuse, Geneva & Corning.—The present directors of this company are: Patrick Lynch, Wm. T. Hamilton, Frank Hiscock, Syracuse, N. Y.; Daniel Beach, John Lang, Watkins, N. Y.; A. H. Gorton, Alexander Olcott, C. C. B. Walker, Stephen T. Hayt, Corning, N. Y.; Edgar Munson, Williamsport, Pa.; John L. Welsh, Philadelphia; I. P. Chambers, Edwin D. Worcester, New York. The officers are: President, Edgar Munson; Vice-President, C. C. B. Walker; Secretary, Alexander Olcott; Treasurer, John Lang.

Western North Carolina.—The board of directors has elected Maj. J. W. Wilson President, Superintendent and Chief Engineer; George P. Erwin, Treasurer; E. H. Marsh, Master Mechanic.

St. Joseph & Pacific.—The first board of directors of this company, formed by the consolidation of the St. Joseph & Pacific and the Kansas & Nebraska, the two companies organized by the bondholders who bought the St. Joseph & Denver City road, is as follows: Edwin Knowles, Seneca, Kan.; J. D. Brumbaugh, Marysville, Kan.; E. N. Morrill, Hiawatha, Kan.; A. M. Saxon, St. Joseph, Mo.; E. C. Atterbury, Trenton, N. J.; Joe F. Navarro, R. W. Donnell, H. H. Butterworth, Charles W. Hassler, Wm. Bond, Alfred Mitchell, Louis Fitzgerald, New York.

Baltimore & Ohio.—Mr. C. M. Wicker is appointed Assistant General Freight Agent, in place of Mr. G. B. Sprigg, now General Freight Agent of the Great Western of Canada. Mr. Wicker's office is at No. 83 Clark street, Chicago. He has been heretofore Agent for the company in Chicago, in which position he is succeeded by Mr. F. Harriett.

Pacific, of Missouri.—In addition to the four directors whose election was noted last week, N. A. Cowdry, of New York, and Adolph Paul, of St. Louis, have been chosen directors in place of T. B. Edgar and J. L. Stephens, resigned.

Chicago, Burlington & Quincy.—At the annual meeting in Chicago, March 28, the following directors were chosen: J. M. Forbes, Sidney Bartlett, Charles J. Paine, T. Jefferson Coolidge, John N. Denison, Boston; Wm. J. Rotch, New Bedford, Mass.; J. N. A. Griswold, Newport, R. I.; Robert Harris, Peter Geddes, J. M. Walker, Chicago; C. E. Perkins, Burlington, Ia. The only change is the retirement of Mr. John W. Brooks, and the election in his place of Mr. John N. Denison, who was a director until a year ago and has been connected with the company for many years.

Pennsylvania.—The board has re-elected Thomas A. Scott President; George B. Roberts, First Vice-President; Edmund Smith, Second Vice-President; A. J. Cassatt, Third Vice-President; Joseph Lesley, Secretary; Bayard Butler, Treasurer.

Houston & Texas Central.—E. W. Cave, of Houston, and Charles Fowler, of Galveston, Tex., have been chosen directors in place of Wm. M. Rice and A. A. Van Alstyne, resigned. The new directors represent the Morgan interest.

Northern, of New Jersey.—At the annual meeting recently the following directors were chosen: Elias Sisson, D. W. McCullough, A. A. Hardenbergh, Lansing Zabriskie, A. S. Devans, J. P. Marquard, J. Hull Browning, W. C. Browning, A. A. Rooback. The road is worked by the Erie.

Virginia Railroad Commissioner.—A new law creating this office having been passed, the Virginia Legislature has elected Col. T. H. Carter, of King William County, to fill it.

International & Great Northern.—At the annual meeting in Houston, Tex., April 3, the following directors were chosen: H. M. Hoxie, R. S. Hayes, James A. Baker, D. H. Smith, Ira H. Evans, Houston, T. x.; Samuel Sloan, Moses Taylor, John S. Barnes, T. W. Pearall, Jacob S. Wetmore, New York. The only new director is Mr. Baker, who succeeds W. H. Hitchins. The board re-elected Samuel Sloan President; R. S. Hayes, Vice-President; Ira H. Evans, Secretary; D. H. Smith, Treasurer; Jacob S. Wetmore, Assistant Treasurer.

Texas & Pacific.—The following appointments of agents have been made: General Eastern Agent, J. J. Fowler, No. 415 Broadway, New York; General Northwestern Agent, Thomas Dorwin, No. 135 Randolph street, Chicago; General Southwestern Agent, P. R. Rogers, Atlanta, Ga.; General Western Agent, J. W. Delaney, Dallas, Texas.

San Francisco & North Pacific.—Mr. P. E. Dougherty is appointed Secretary, General Passenger, Ticket and Purchasing Agent and Paymaster, in place of James O'Neill. Mr. W. S. Mason succeeds Mr. Dougherty as Freight Auditor.

Petersburg.—Mr. R. G. Pegram is Acting President, in place of H. T. Douglas, resigned.

Connecticut Valley.—Mr. George H. Griggs, General Superintendent, will hereafter act as General Passenger Agent also.

Columbus & Toledo.—Mr. Frank Janes has been appointed General Agent, with office at Toledo, O.

Cincinnati, Hamilton & Dayton.—Mr. F. H. Short, late President, remains with the company as Secretary and Treasurer, which position he occupied for many years and up to the time when he succeeded the late Mr. McLaren as President.

Syracuse & Chenango.—The purchasers of this road at the late foreclosure sale met in Syracuse, N. Y., recently and organized a new company by the election of the following directors: James J. Belden, Alfred A. Howlett, George F. Comstock, John Greenway, Alva W. Palmer, Joseph J. Glass, Henry D. Dennison, Horace Canoe, B. Nelson Gere, Henry L. Duguid, William Brown Smith, A. Cadwell Belden, Dennis McCarthy. The board elected James J. Belden, President.

Carthage.—At the annual meeting in New York, April 2, the following directors were chosen: John R. Marshall, C. G. Franklyn, J. G. McCullough, S. C. Thompson, Andrew Boardman, G. A. Hoyt, J. M. Burke, T. W. Park, H. H. Baxter, F. Butterfield, W. P. Clyde, Joseph Ogden, New York; John P. Jones, Virginia, Nev. The only new director is Mr. Ogden, who replaces Thomas Clyde. The board subsequently re-elected Trevor W. Park President; J. G. McCullough, Vice-President; W. J. Emmett, Secretary and Treasurer.

Louisville, Cincinnati & Lexington.—Mr. S. S. Parker has returned to his former position as General Passenger and Ticket Agent. Mr. C. R. Kelly, late General Ticket Agent, and John Kilkenny, late General Passenger Agent, remain with the road as assistants to Mr. Parker.

Racoon Valley.—The first board of directors of this new company consists of Phineas M. Kent, Henry Crawford, George F. Bidwell, Samuel McConnell and George M. Rogers. The office is in Brazil, Ind.

PERSONAL.

—Among the gentlemen prominently mentioned as candidates for the Governorship of New Jersey at the next election are two receivers, Judge Lathrop, of the New Jersey Central, and Hon. G. A. Hobart, of the New Jersey Midland. Another prominent candidate is Hon. Jacob Vanatta, Counsel of the Delaware, Lackawanna & Western.

—Col. Lucien Tilton, formerly for some time Chief Engineer and Superintendent of the Toledo, Wabash & Western, died recently at his residence in Chicago. He was 60 years old and had lived in Chicago for several years past.

—Mr. Charles Francis Adams, Jr., has been appointed, by the Governor of Massachusetts, a Commissioner of the Norwich & Worcester sinking fund, in place of ex-Gov. Emory Washburne, deceased.

—Mr. Foster Church has resigned his position as Master Mechanic of the Troy & Boston Railroad after a service of 19 years on the road.

—Mr. H. T. Douglas, President, and B. R. Dunn, Superintendent of Transportation of the Petersburg Railroad, have resigned their respective positions.

—Elizabeth Bragg, C. E., of San Francisco, presented as her thesis, on graduating from the University of California last year, a "Solution of a Peculiar Problem in Surveying." Field or office work preferred?

—Mr. D. M. Boyd, Jr., General Passenger Agent of the Pennsylvania Railroad, died April 2 at Jacksonville, Fla., where he had gone for the benefit of his health. All of Mr. Boyd's adult life has been passed in railroad work, his first service being on the old Bellefontaine Railroad, in Ohio, while yet a young man. He came to the Pennsylvania Railroad twelve or thirteen years ago as Assistant General Passenger Agent, and succeeded Mr. Gwinner as General Passenger Agent in 1872. His health has been failing for some months past, and he went to Florida as a last resort.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Dec. 31:	1876.	1875.	Inc. or Dec.	P. c.
St. Louis, Alton & T. H., Main Line &c.	\$1,072,503	\$1,019,838	Inc. ..	\$52,665 5.2
Expenses.....	862,744	824,165	Inc. ..	38,579 4.7
Net earnings.....	\$209,759	\$195,673	Inc. ..	\$14,086 7.2
Earnings per mile.	5.800	5.230	Inc. ..	270 5.3
Per cent. of exps.	80.44	80.82	Dec. ..	0.36 0.5
St. Louis, Alton & T. H., Belleville Line	498,742	561,860	Dec. ..	63,127 11.2
Expenses.....	274,192	346,473	Dec. ..	72,281 10.9
Net earnings.....	\$224,550	\$215,396	Inc. ..	\$9,154 4.2
Earnings per mile.	7.024	7.914	Dec. ..	800 11.2
Per cent. of exps.	54.98	61.66	Dec. ..	6.68 10.8
Three months ending March 31:				
New Jersey Midland.	\$139,140	\$126,743	Inc. ..	\$12,397 9.8
Net earnings.....	34,826	.....	.....	.....
Per cent. of exps.	74.99	.....	.....	.....
Two months ending Feb. 28:				
Mobile & Ohio.....	1877.	1876.		
Mobile & Ohio.....	\$406,775	\$410,638	Dec. ..	\$3,863 0.9
St. Louis & South-eastern.....	171,021	164,490	Inc. ..	6,531 4.0
Net earnings.....	36,651	23,764	Inc. ..	12,887 54.2
Per cent. of exps.	78.58	85.54	Dec. ..	6.96 8.1
Month of February:				
Intercolonial.....	\$67,165	\$57,049	Inc. ..	\$10,116 17.7
Mobile & Ohio.....	174,393	178,249	Dec. ..	3,856 2.2
Month of March:				
New Jersey Midland.	\$46,305	\$42,584	Inc. ..	\$3,721 8.7
Third week in March:				
Atchison, Topeka & Santa Fe.....	171,021	164,490	Inc. ..	6,531 4.0
Denver & Rio Grande.....	\$51,463	\$49,142	Inc. ..	\$2,321 4.7
St. Louis, Iron Mt. & Southern.....	11,897	.....	.....	.....
90,300	66,222	Inc. ..	24,088 36.4	

Grain Movement.

Baltimore grain receipts for March were as follows:

	1877.	1876.	Decrease.	P. c.
Flour, barrels.....	94,990	109,181	14,191	13.0
Wheat, bushels.....	84,46	104,315	20,169	19.3
Corn.....	2,432,133	2,617,420	185,287	7.3
Other grain.....	62,094	61,480	9,396	16.3
Total, bushels.....	3,043,323	3,329,120	285,797	8.6

For the three months ending March 31 the receipts were:

	1877.	1876.	Decrease.	P. c.
Flour, barrels.....	285,189	304,952	19,763	6.5
Grain, bushels.....	7,279,566	8,284,912	1,005,346	12.1
Total, bushels.....	8,705,511	9,309,672	1,104,161	11.3

The exports of flour for March were 22,100 barrels. On March 31 there were 70,865 bushels wheat and 820,796 bushels corn in the elevators.

Coal Movement.

Coal tonnages for the week ending March 24 are reported as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Anthracite.....	301,644	158,552	Inc. ..	143,292 90.5
Semi-bituminous.....	44,552	51,913	Dec. ..	7,361 14.2
Bituminous, Pennsylvania.....	34,630	32,796	Inc. ..	1,834 5.6
Adjourned meeting of representatives of the anthracite companies was held in New York, March 29, officers of all the companies being present. No action was taken except to appoint a committee, consisting of Messrs. Franklin B. Gowen, Robert H. Sayre and Thomas Dickson, with instructions to prepare a plan for the improvement of the trade "involving an advance of price of at least 50 cents per ton at tide-water."				
The Baltimore & Ohio has reduced the rates on Cumberland to tide-water 18 cents per ton, the rate being now \$1.62 per ton from Cumberland to Locust Point for shipment, and \$1.87 for local trade. It is reported that there have been some private contracts made at 25 cents per ton below these figures. To meet these rates it is understood that the Chesapeake & Ohio Canal will probably make a reduction also.				
The coal tonnage of the Belvidere Division, Pennsylvania Railroad, for the three months ending March 31 was:				
Coal Port, for shipment.....	491	10,876	Dec. ..	10,385 99.8
South Amboy, for shipment.....	125,416	98,433	Inc. ..	26,983 27.4
Local distribution on New Jersey lines.....	40,142	30,813	Inc. ..	9,329 30.3
Company's use on New Jersey lines.....	17,631	13,382	Inc. ..	4,242 31.7
Total.....	183,680	153,504	Inc. ..	30,176 19.7

Of the total this year 108,208 tons were from the Lehigh, and 75,472 tons from the Wyoming Regions.

Rates from Missouri River Points.

At the monthly meeting of the Southwestern Railroad Rate Association in St. Louis, March 28, besides the usual routine business, it was resolved to make the rate on grain from Kansas City, Leavenworth, Atchison or St. Joseph to St. Louis 16 cents per 100 lbs. and to Chicago 23 cents. The old rates were 17½ cents to St. Louis and 22½ to Chicago.

RAILROAD LAW.

Pennsylvania Railroad Taxation.

The new Pennsylvania tax law provides that every railroad, canal, navigation, street railroad, or other transportation company, including express and sleeping-car companies, shall pay to the State a tax of eight-tenths of one per centum on its gross receipts, to be paid in two semi-annual installments, the first payment to be made July 1, 1877. Each company must make to the Auditor General a sworn statement semi-annually of such gross earnings, failure to make such return or pay the tax being punishable by a penalty of 10 per cent. on the amount of tax. Where a transportation company has also the right to mine, buy and sell coal, the receipts derived purely from such dealings in coal may be kept separately, but the company shall include in its gross earnings the transportation of such coal over its lines at the same rates as are charged to other parties. Where the property of one company is leased to another the tax may be paid by either the lessee or the lessor corporation according to their agreement, but the State will first look for payment to the corporation actually holding and operating the property. Unpaid taxes and penalties may be collected in the same manner as taxes on any other property.

Evading Claims by Foreclosure.

Speaking of the general question of damages for injury by railroad accidents, the *Central Law Journal*, of St. Louis, says: "Another matter which should command the attention of legislatures, and which we especially command to the Missouri Legislature, just assembled, is the facility with which railroad corporations avoid the payment of such liabilities. A mortgage is placed upon all the railroad property; the bonds are purchased at a small percentage of their face value by the stockholders, or by those of them who are in the ring. As soon as the directors find the corporation loaded down with a sufficient accumulation of these floating liabilities, default is made in the payment of the interest, and suit in equity is brought to foreclose the mortgage. This suit is brought in the name of some one bondholder, for himself and all the others. A committee is appointed to bid for the bondholders at the sale. No person or corporation is able to offer an amount of cash equal to the par value of their bonds, and they become the purchasers. Thus it is that substantially the same persons do duty as mortgagors and mortgagees, and as vendors and purchasers. The property has been regularly sold to foreclose a mortgage, and, in the eye of the law, belongs to a new and different owner. A new corporation is formed with a new name, to whom the purchasing committee conveys it. This purchasing committee receive securities of the new corporation to distribute among the old bondholders according to their proportionate share; and if any of these bonds should, by any accident, have gotten into the hands of widows, orphans, lunatics or other ignorant persons, and these persons do not appear, within a prescribed length of time, to claim their share of the securities, the members of the purchasing committee proceed, perhaps, to divide them among themselves, as was done in a celebrated case about which a lawsuit is pending in one of the courts of New York City. * * *</p

some of the courts are such as to amount almost to malicious intent on the part of the railroad managers. *

"In the cases cited where the English rule is not recognized, the element of contributory negligence rarely enters, for the reason that it was held not to be negligence on the part of the owners of animals to allow them to run at large. The best considered cases require, on the part of railroad managers, the exercise of ordinary diligence in the use of their property so as not to injure others. It will also be seen by an examination of the cases cited from the reports of Ohio, Illinois, Missouri, Iowa, and other States where the rule under consideration is not in force, that the degree of negligence on the part of the railroads that renders them liable is merely such as will render persons liable, ordinarily, for injuries to the property of others by a careless use of their own. But the courts in these States have, for the most part, carefully avoided going to the extreme of imposing upon railroad corporations the duty of observing a degree of diligence in avoiding the infliction of injury upon others that would make them the insurers not only of what they undertook to carry, but of all the animals that run at large on the line of their roads. None of the authorities cited undertake to fix upon the railroad companies the duty of fencing their tracks. Where, however, this duty is imposed by statute, it has been held that the company is *prima facie* liable for injuries resulting to animals wandering on the track through defects in the fence. *

"The true rule, as deduced from the best considered cases, decided where the rule is recognized, as well as where it is rejected, seems to be, that if the engineer of a moving train could, by the exercise of the diligence of a prudent man engaged in his particular calling, avoid the collision, then the company would be liable for the consequences of such collision. But when the animals are injured by any dangerous agencies, which are the usual, lawful and necessary incidents of the place on which they stray, their owners have no redress."

Liability of Carrier for Loss on Connecting Lines.

In the case of *Lockwood & Son* against the *Erie Railway Company*, the Supreme Court of Ohio lately decided as follows:

Where goods are shipped under a contract with a common carrier, to be carried over several independent but connecting lines to their destination at an agreed through rate, each carrier to receive and carry to the end of his route, and then forward by the next connecting line, and they are lost at the terminus of the route of an intermediate carrier, while in his possession and before delivery to the next carrier—Held:

1. Such intermediate carrier undertakes not only to carry, but to forward, and, as a common carrier, he is liable for loss at the end of his route, before the goods are delivered to the next carrier, unless he is exempted from such loss by the terms of his contract.

2. Although the contract of affreightment contains a clause relieving the carrier from loss by fire, he is not therefore exempted from the use of proper care for the safety of the goods while in his possession to be forwarded. It is his duty to keep them while in his hands awaiting shipment in a safe and proper place, and the burden of proof is on him to show that he has done so, although the fire originated without his fault, in adjacent property over which he had no control, and although he made all reasonable efforts after it originated to prevent it from extending to the goods destroyed.

3. When the carrier is liable for such loss the owner is entitled to full compensation for the breach of the contract to carry and forward, and it is not error in the Court to refuse to lay down rule of damages, which may not give him such compensation nor unless it appears from the record that the failure to so charge was prejudicial to him.

THE SCRAP HEAP.

[Continued from Page 153.]

The Cawood Swage Block Cases.

The cases of *Turrill* against the *Illinois Central*, the *Chicago & Alton*, the *Chicago, Burlington & Quincy*, the *Lake Shore & Michigan Southern* and the *Pittsburgh, Fort Wayne & Chicago* for infringement of the *Cawood Swage block* patent are now before the United States Supreme Court, the companies having appealed from the decision of the Circuit Court against them. Argument in all the cases was heard in Washington March 28. It will be remembered that the Circuit Court gave Mr. *Turrill*, as owner of the patent, heavy damages for infringement. The patent is for a swage block used in repairing rails.

New York & Long Island Bridge.

At a meeting of the directors held March 28 it was resolved to award the premium of \$1,000 for the best design for the proposed bridge to the *Delaware Bridge Co.*, C. Macdonald, President; for the second-best design, \$500 to *Clark, Reeves & Co.*; for the third best, \$250 to *Flad & Co.*, of St. Louis. The *Delaware Bridge Co.*'s design consists of two spans of 735 and 620 ft. over the two channels of the *East River*, with viaduct approaches on the *New York* and *Long Island* shores, and shorter intermediate spans over *Blackwell's Island*.

International Sleeping Car Company.

A company with this name has recently been incorporated in Belgium, designed, apparently, to do on the Continent just what the *Pullman Palace Car Company* does here, that is to run sleeping cars, parlor cars and restaurant cars. The capital is \$800,000, in shares of \$100 each, and the company may issue \$200,000 of 6 per cent. bonds. It absorbs the "Mann Railway Sleeping Carriage Company," which takes \$599,300 of the shares. Other incorporators are George and Edmond Nagelmackers, a Mr. Evans (a London banker), Saint Paul de Sincay, Baron W. del Marmol, Henri Peltzer, Alfred Orban, Joseph Jooris, Charles Delloye-Matthew, and J. Orban-Dumont. The office is, we believe, at Brussels.

Prices.

Iron rails are quoted at \$33 to \$37 per ton at the mills, and steel at \$48.50 to \$50; but we hear of a sale of steel to be delivered 200 miles from the mill at \$48. In New York No. 1 foundry pig is quoted at \$19 to \$20; No. 2 at \$18 to \$19, and forge at \$17 to \$18. Old rails \$19; scrap, \$26.

An Imposter.

Meers. E. S. Alexander & Co., of Chicago, manufacturers of "four ace" paint, give notice that a man is traveling, generally visiting the railroad offices, who represents himself as the brother of the senior member of this firm, and as in their employ, whereas they have no one traveling for them. The man has lost his left thumb.

OLD AND NEW ROADS.

Houston & Texas Central.

The Western Division, from *Hempstead*, Tex., to *Austin*, 115 miles, was changed from 5 ft. 6 in. to 4 ft. 8 1/2 in. gauge on March 27. This does away with the last section of 5 ft. 6 in. gauge in Texas and makes the Central road of uniform gauge throughout. But little equipment remains to be changed, and the expense will not be great.

The change in control of the road has been completed by the election of two representatives of Mr. Morgan to the board of directors in place of two of the Texas directors, who have resigned. It is stated that no changes in the officers will be made until the annual meeting.

Mr. W. W. Phelps, one of the directors, states in the *Galveston News* that the floating debt of \$3,000,000, about \$1,600,000 is payable in New York, of which \$1,465,000 is for money

advanced by some of the directors there and the balance for supplies bought. Most of the amount due in New York is secured by pledge of second-mortgage (consolidated) bonds.

Syracuse and Chenango.

The parties who bought this road at the recent foreclosure sale met last week in Syracuse and organized a new company. The new ownership is substantially the same as the old, and but few changes have been made on the road.

Cincinnati & Eastern.

This road has now trains running to *Williamsburg*, O., nine miles eastward from the late terminus at *Batavia*, and 24 miles from the junction with the *Little Miami* road near *Newtown*. Work is progressing on the line to *Winchester*, 24 miles beyond *Williamsburg*.

Atlantic, Mississippi & Ohio.

The special committee of the Virginia Senate has presented a long report setting forth the history of the company and its present troubles in detail, and charging that the intention of the foreign bondholders is to secure possession of the road subject to the old divisional bonds, and to set aside altogether the State's interest in the road. The committee recommends that the Board of Public Works be instructed to watch the proceedings in the foreclosure suit, and to take the proper steps to protect the interest of the State in the road.

Philadelphia & Reading.

The amount of interest and floating debt whose postponement is arranged for by the plan lately submitted by the company is as follows:

General mortgage bonds, \$19,686,000, half interest for three years.....	\$1,771,740
Improvement bonds, \$9,384,000, half interest for three years.....	842,760
Debenture bonds, \$11,686,300, all interest for five years.....	4,083,905
Floating debt, 90 per cent., various periods, about.....	7,425,000
Total.....	\$14,192,705

The first-mortgage bonds amount to \$5,573,500, on which the annual interest is \$360,930, and the consolidated or second-lien bonds to \$18,617,000, on which the interest is \$1,223,510; interest on these two classes of bonds the company purposes paying in full. It is also stated that interest on the *Philadelphia & Reading Coal & Iron Company's* first and second-mortgage bonds will be paid in full.

The company has had the following letter, signed by General Manager *Wooten*, addressed to all the members of the Brotherhood now on the road:

"DEAR SIR—In view of the recent high-handed interference with the business of railroad companies, and the serious and sometimes fatal consequences that have resulted to the innocent traveling public from the unjustifiable and arbitrary conduct of the organization known as the Brotherhood of Locomotive Engineers upon other railroads, it has been deemed unadvisable to retain in the employment of this company any one who is a member of that organization.

"If you are in such membership you will be called upon in a day or two to decide whether you desire to remain in the employment of the company by complying with the regulation requiring you to withdraw from the association referred to.

"It is not the desire of the company to deprive its members of any of the beneficial or life insurance features of the society of the Brotherhood of Locomotive Engineers without offering in their stead greater benefits of a similar character; and it is therefore proposed by the company to establish and endow a life and accident insurance fund, out of which all engineers, upon payment of a monthly sum less than previously paid, will receive, in case of accident or death, greater benefits than those heretofore derived from the Brotherhood of Locomotive Engineers.

"Upon being informed of your desire to continue in the employment of the company the undersigned will be pleased to give any information you may desire as to the details of the beneficial fund, and to discuss with you directly any question involving your relations with the company."

For a day or two it was thought probable that a general strike would follow, but no such action has been taken, and the latest advices represent the officers of the company as stating that only a few men had left the road, most of them having decided to accept the company's terms.

Zumbro Valley & St. Paul.

It is proposed to build a railroad from St. Paul, Minn., south by east through Zumbro, Rochester and Chatfield to a point on the Southern Minnesota, with a prospective future extension to a connection with the Davenport & Northwestern road in Iowa. The line would occupy very much the same ground as the proposed extension southward of the Minneapolis and St. Louis road.

Raccoon Valley.

A company by this name has been organized to build a railroad from Montezuma, Ind., southeast to Brazil, about 25 miles. The capital stock is to be \$100,000.

Rochester, Nunda & Pennsylvania.

An attempt is being made to reorganize this company and to secure the completion of the road as far as Mt. Morris, 15 miles north of Nunda, where it will connect with a branch of the Erie running to Rochester. The projectors are trying to secure aid from the Erie and the Lehigh Valley.

Baltimore & Ohio.

Arguments on the exceptions made by the company in the suit brought by the State of Maryland to enforce its claim to a tax of one-half of 1 per cent. on the gross receipts of the road were concluded last week. The Court reserved its decision.

Some 300 men, mechanics and laborers, were last week discharged from the Mount Clare shops in Baltimore. The reductions were about equal in the various departments of the works, and the number discharged was about one-fifth of the whole.

Marietta, Pittsburgh & Cleveland.

An order of foreclosure and sale has been granted for this road and it is to be sold as soon as the legal notice can be given.

Chicago, Clinton & Western.

By the compromise lately agreed on with the creditors and allowed by the Court, the Receiver is to be allowed to issue \$100,000 in certificates with which he expects to extend the Iowa City end of the line from Lennox, Ia., eastward to Tipton, 15 miles, and to extend the Clinton end west to a connection with the Davenport & Northwestern road. A good deal of the work for these extensions has already been done.

Extensions of Mail Service.

Mail service is ordered over the Duck River Valley road, from Columbia, Tenn., to Lewisburg, 20 miles.

Springfield & Northwestern.

The people along the line are trying to secure the construction of an extension of this road from Havana, Ill., to Lewistown, 10 miles. It is thought, however, that nothing can be done until a decision is reached in the foreclosure suit.

Central Pacific.

On the new loop line from Oakland, Cal., to Banta, track-laying has been begun on the western end. A good deal of work is being done on the tunnels near Pinole and the other

heavy work in that neighborhood. The final location at the Straits of Martinez is now being completed by the engineers.

Meetings.

Meetings will be held as follows:

Lake Shore & Michigan Southern, annual meeting, at the office in Cleveland, O., May 2, at 11 a. m.

Delaware & Hudson Canal, at the office in New York, May 8, at noon.

Genesee Valley.

It is proposed to organize a company to purchase the Genesee Valley Canal from the State of New York and to use it as the road-bed for a railroad from Rochester south by west to Clean, or to the Pennsylvania line.

Texas Western.

This company's officers state that its road is now in operation to *Pattison*, Tex., 41 miles westward from *Houston* and 11 miles beyond the late terminus at *Wimberly*. Work is actively in progress on the grading beyond *Pattison*.

Baltimore & Cumberland Valley.

Arrangements have been made to organize a company by this name to build a branch of the Western Maryland from *Smithsburg*, Md., north by west to *Chambersburg*, Pa., about 21 miles. The line has been surveyed and is said to present no great difficulties.

Columbia & Port Deposit.

The track has been laid on the four-mile gap which remained in this road at the close of last year. The rails are now all down from *Columbia*, Pa., southeast to *Port Deposit*, Md., 40 miles, and the road will soon be ready for trains.

Virginia Railroad Commission.

The Legislature of Virginia has passed and the Governor approved the bill providing for the appointment of a Railroad Commissioner. That officer is to have a general supervisory power over the railroads of the State, to see that they conform to the laws and to receive reports from them. He is to make an annual report to the Legislature.

Ogdensburg & Lake Champlain.

In the New York Supreme Court, April 3, the agreement for the settlement of all differences between this company and the former lessee of the road, the Central Vermont, was formally approved. The Court then made an order directing the Receiver to surrender the property to the officers of the Ogdensburg & Lake Champlain Company, which will hereafter operate its own road.

Cincinnati, Sandusky & Cleveland.

On March 30, on application of *Rush R. Sloane*, formerly President of the company, the Circuit Court at Fremont, O., made an order appointing *James Lea Receiver*, and the following day he qualified and took possession of the road. It is said that there is to be a general change in the employees, and that Sloane will be the real manager of the road. It will be remembered that Sloane was a defaulter to the company and ran away nearly three years ago, but subsequently made a partial settlement and least returned, and the indictments pending against him were withdrawn by the District Attorney. Since Sloane absconded the management has been in the hands of the Boston stockholders, though reports have lately been current that Sloane was planning to secure the control again. The dispatches do not state the grounds on which the order appointing the Receiver were granted.

Mr. J. S. Farlow, President of the company, telegraphed to Boston on April 2 as follows:

"Tell our stock and bondholders not to sacrifice their property. Assure them that everything will be right in a few days."

Dividends.

Dividends have been declared as follows:

	January.	February.	March.	Total.
Passengers.....	\$5,409 44	\$8,151 88	\$10,345 62	\$23,906 92
Freight.....	20,120 89	20,047 55	18,772 87	58,941 31
Milk.....	14,545 84	9,904 59	12,268 09	36,608 02
Miscellaneous.....	10,127 23	4,027 35	4,928 45	19,062 03
Total.....	\$50,203 40	\$42,631 35	\$46,905 03	\$139,139 78

Working exp'n's, less Montclair, R. R. proportion of terminal charges.....

January 34,851 86

31,698 48

37,763 29

104,313 66

Net earnings.....

\$15,351 54

\$10,032 87

\$8,541 74

\$34,932 15

The working expenses for the quarter were 74.99 per cent. of the receipts. As compared with the same period in 1876 the gross earnings show an increase of \$12,397.04, or 9.8 per cent.

The result may be considered as very good, especially when it is remembered that, from the nature of the business of the road, this quarter is one of lightest receipts and proportionally the heaviest expenses.

The Receiver's current account for the quarter is as follows:

Balance, Jan. 1.....

189,139 75

Receipts on road account.....

45,028 72

" " loan account.....

184,134 00

Total.....

ascertain of what mortgages, bonds, stocks and debts due to it the company was owner during the period covered by the tax claim on its gross receipts; which of its hotels were used exclusively for the accommodation of travelers upon the road and the company's employees on its main stem, and which for guests generally who might claim to stop; the cost of the road, etc., when completed to the Ohio River, and the aggregate number of the shares of stock. The company claims that under the exemption in its charter of the shares of the capital stock from taxation all its property is also exempted. It also insists that the earnings of the road made in other States, especially its branches, the Winchester & Potomac and the Winchester & Strasburg roads, in Virginia and West Virginia, were not subject to taxation in the State of Maryland. The provisions of the acts of Assembly in 1872 and in 1874 were commented on to show that the latter exempted that part of the road outside of the State. On the part of the State it is urged that the exemption referred to can exempt no more property of the company than was necessary for the construction of the road to the Ohio River, and such lateral roads within the State as may have been constructed and repaired under the original charter; that the stock issued for the purpose does not represent any other property, and if the property is exempt because the stock is exempt, that all other property or interest not necessary for the purpose of such construction, etc., under the charter is liable to the tax; that the gross receipts, no matter where earned, when brought into the State became subject to the taxing power of the State, and that all property, if allowed to remain in the hands of the company, is held by it as trustee for the stockholders, and if it would be liable in their hands it is liable in the hands of the company, though invested in its corporate name."

Des Moines, Afton & Missouri.

This projected road is to run from a point near Winterset, Ia., on the Winterset Branch of the Rock Island road, southward through Afton to Mount Ayr in Ringold County, about 50 miles. It is intended eventually to run further southward into Missouri. The projectors are trying to secure subscriptions along the line and also some aid from the Rock Island Company.

Syracuse, Geneva & Corning.

The statement that the contract for all the wooden bridging on this line had been let to George W. White is not correct, he having only a part of the work. Messrs. C. E. Danforth & Co., who have graded a section of the road, have a contract for two Howe truss bridges, each of 157 feet span, on first class masonry, and for 1,200 feet of heavy trestle bridging, on which they are now at work.

The work on this whole line is well advanced and some of the heaviest sections are done, including the iron bridges over Chemung River at Corning and over Watkins Glen. The road is to extend from Corning, N. Y., northward to Geneva on the Auburn Branch of the New York Central & Hudson River, and it is proposed to extend it 12 miles further to the Main Line of the Central at Lyons. It is intended to furnish a new outlet to the coal from the Morris Run and Fall Brook Mines on the Corning, Cowanesque & Antim road, with which it connects at Corning. It is said to be very favorably located for this purpose, there being a descending grade or level all the way from Corning to Geneva, with the exception of a very short grade of 35 feet to the mile near Corning. The general contractor for the whole line is Gen. George J. Magee, of Watkins. The principal stockholders are also interested in the Morris Run Coal Company, and it is reported that the New York Central & Hudson River Company has agreed to furnish the rails, taking pay in bonds.

St. Louis & Southeastern.

Notice is given to the holders of consolidated bonds that the committee has extended the time for deposit of bonds to May 1, 1877. All bondholders desiring to join in the reorganization of the company are requested to deposit their bonds before that date with the Continental National Bank, New York, and to pay the assessment of one-quarter of 1 per cent. upon their face value.

The Auditor's report of earnings for February is as follows:

St. Louis	Kentucky	Tennessee	Whole
Div.	Div.	Div.	Inc.
Gross earnings	\$47,164 19	\$21,491 44	\$11,108 57
Expenses	36,091 03	21,216 67	10,593 55
Net earnings	\$11,073 16	\$274 77	\$79,764 20
Earnings per mile	224 59	219 30	224 06
Per cent. of expenses	76.46	98.68	98.14
			\$5.09

As compared with February, 1876, there is a decrease of \$3,883.56, or 4.6 per cent., in gross, and of \$490.34, or 4.0 per cent. in net earnings.

Western Counties.

Mr. Plunkett, of the firm of Shanly & Plunkett, contractors for this road, has returned from England, and it is said that work will soon be resumed. A cargo of rails from England recently arrived at Digby, N. S.

There has been quite a lively debate in the Nova Scotia Legislature over this road, charges having been made that the Government had accepted the contractors' work too readily and that some very shabby work had been done on the grading, there being too large a proportion of logs and brush in the embankments. These charges were, however, emphatically denied, and it is said that they were made by political opponents to embarrass the Government.

Arkansas Railroad Commission.

A law passed by the late Legislature of Arkansas provides that the Board of Railroad Commissioners of that State shall thereafter consist of the Governor, Secretary of State and Commissioner of State Lands.

Atlantic & Gulf.

The Receivers give notice that they will pay the past due coupons on the first-mortgage sectional bonds on and after March 31, at the company's office in Savannah, or at the office of Perkins, Livingston, Post & Co., No. 23 Nassau street, New York.

Royal Land Company.

This company's railroad (formerly the Potomac, Fredericksburg & Piedmont) was to be formally opened from Fredericksburg, Va., to Orange on April 4, on which day an excursion train was to be run over the line.

The people of the Northern Neck, the peninsula between the Potomac and Rappahannock rivers, are anxious to secure railroad connection with Fredericksburg, and their representatives have been in conference with the officers of the Royal Land Company, with reference to an extension of its road from Fredericksburg southeast to some point in Northumberland County. The distance is about 70 miles.

Chesapeake & Ohio.

The decree of foreclosure and sale granted by the Virginia Circuit Court provides for the security of the old Virginia Central bonds very carefully. Its provisions in this respect are thus summed up by the Richmond *Whig*:

"Two hundred thousand dollars to be paid by the purchaser in cash, deducting what may be in the hands of Gen. Wickham, the Receiver, now or when the road is sold.

"After liquidating certain indebtedness (which is recited) the balance of the cash is to be used for the payment of the interest due on the bonds of the Virginia Central road past due."

"The remainder of the interest that is due on the bonds of the Virginia Central road to be paid within three years from the date of sale, with interest.

"The 8 per cent. bonds (which amount to \$300,000 without interest), under a mortgage past matured, to Young & Harrison as trustees, to be settled for in five years from date of sale, to bear 6 per cent. interest, payable every six months.

"The bonds amounting to \$100,000, exclusive of interest, under mortgage to the Board of Public Works of the State, to be paid on the 1st of April and July, 1880, to be provided by new bonds with interest payable every six months.

"The bonds bearing 6 per cent. interest under a trust secured to Lyons and Fry, in 1854, to be settled with new bonds to be paid up on 1st July, 1887, with interest to be paid every six months.

"The bonds known as dividend bonds and interest-funded bonds, about \$175,000, to be paid in five years from the day of sale, bearing 6 per cent. interest. The parties purchasing the road to give a mortgage for all deferred payments, and also providing in the most emphatic and stringent manner possible for the foreclosure of the mortgage given by the prospective purchasers in case of default of payment of the installments—a notice of 90 days to be given by Gen. Wickham in all the papers of the city before the day of sale."

The decree of foreclosure is under the Chesapeake & Ohio first mortgage, to which the Virginia Central bonds are a prior lien.

Cincinnati, Hillsboro & Jackson.

A company by this name has been organized to build a railroad from Hillsboro, O., westward to Jackson, about 65 miles.

North Pacific Coast.

This company has let a contract for the construction of a bridge over Russian River, at Moscow, Cal., the present terminus of the road. The contract price is \$35,000, and the work is to be finished by June 1.

Alta Branch.

Work is in progress on a narrow-gauge road from the Central Pacific at Alta, Cal., to Towle's Mill, five miles distant. It is intended to carry lumber to Alta for shipment.

Eureka Iron Company.

This company has completed a branch line 1 1/2 m les long from Standford, Ala., on the South & North Alabama road, to its iron ore bed, and expects to extend the track about a mile further to a coal bed on the same property. The road is of 5-ft. gauge.

Panama.

The following statement of this company's business is for the half-year ending March 31, 1876:

Receipts for New York business.....	\$469,681
" on London	245,608
" on the Isthmus and miscellaneous.....	134,079
 Total.....	\$846,968
Operating expenses.....	\$161,000
Subsidy to U. S. of Colombia.....	125,000
Interest on bonds.....	106,000
 Net balance.....	\$455,968

Both earnings and expenses for March are partly estimated.

Lake Erie & Louisville.

The bondholders who bought this road at the recent foreclosure sale have organized a new company by the same name and have filed the necessary certificates in Ohio. The capital stock of the new company is fixed at \$1,500,000. It is said that arrangements will be made to extend the road from St. Mary's, O., southwest to Cambridge City, Ind., according to the original plan.

East Tennessee, Virginia & Georgia.

This company is now laying a large quantity of steel rails on its line east of Knoxville, Tenn.

Pennsylvania.

The Altoona (Pa.) *Sun* of March 31 says: "A meeting of railroad men was held in this city on Wednesday. The object of the meeting was to determine on a standard style of making box cars to be used on all lines operated by the Pennsylvania Railroad Company. The following gentlemen composed the party: General Manager, Frank Thompson; James McCrea, Superintendent of Middle Division; Howard Fry, Superintendent of Motive Power Philadelphia & Erie Division; F. J. Kimball and A. D. Hepburn, of the Empire Transportation Company; J. H. Flager, George Matheson, James B. Converse, all of McKeesport; J. D. Layng, Pittsburgh, Fort Wayne & Chicago; G. Gus. Conn, S. M. Cummings, John Marquis, G. D. Hall, J. White, F. Winter and William Cabbage, all of Pittsburgh. The party visited the shops on Thursday."

There has been a general reduction in working forces along the line, especially among the men employed at stations, a good many having been already discharged. In most cases additional duty has been assigned to the remaining employees, a small increase of pay being allowed them for the extra work. The force in the Maintenance of Way Department has been increased, as is usual at this season.

Eric.

In answer to a letter from several large stockholders, Messrs. E. D. Morgan and J. L. Welsh, as representatives of the Reconstruction Trustees in the United States, state that all payments of assessments on the stock not made before March 31 will be charged with an addition of 10 per cent. They also state that, in accordance with the laws of New York and with the plan of reconstruction, stockholders will have the right to join, on payment of the assessment and the 10 per cent. penalty, up to the end of six months after the organization of the new company.

In case of the failure of the plan all assessments paid on the stock will be refunded, subject to a deduction for expenses, which will probably be very small.

The New York Supreme Court has authorized Receiver Jewett to settle and compromise the suits now pending against the London Banking Association.

The Receiver's report for January is as follows:

Balance on hand Jan. 1.....	\$282,468 37
Receipts for the month.....	2,168,051 86
 Total.....	\$2,450,455 23
Disbursements	2,150,709 83
 Balance Feb. 1.....	\$299,745 76

The receipts exceeded the disbursements for the month by \$17,342.33. The increase in outstanding Receiver's certificates during the month was \$382,205.55; there were \$1,633,879.70 of these certificates outstanding Jan. 31.

Central, of New Jersey.

The Chancellor has authorized Receiver Lathrop to pay interest or rental dividends now due or about to become due on South Branch stock, New York & Long Branch stock and Newark & New York bonds. The dividends on New York & Long Branch stock are not to be paid on any of the stock owned by the Central Company or John W. Watson.

Nashville, Chattanooga & St. Louis.

Tennessee papers state that this company has purchased the Winchester & Alabama and the McMinnville & Manchester

roads. The purchase is stated to have been made at very low rates, and in the same manner as the Tennessee & Pacific was lately acquired, by buying all the stock. Some money will be required to put the lines in good condition.

The Winchester & Alabama road is 37 miles long, from Decherd, Tenn., westward to Fayetteville. The McMinnville & Manchester extends from Tullahoma, Tenn., northeast to McMinnville, 34 miles. Both roads are branches and feeders of the Nashville, Chattanooga & St. Louis.

Indianapolis, Bloomington & Western.

The testimony on the application for the removal of General Wright and the appointment of a new Receiver has all been taken, and arguments were heard in Chicago, March 27, before a Master, whose report has not yet been submitted to the Court.

Springhill & Parrboro.

This road is now nearly completed, the track being all laid, from the coal mines at Springhill, southwest to Parrboro, Nova Scotia, 27 miles. The terminus of the road is a mile south of Parrboro town, on Whitehill Creek, just above its mouth, on the Bay of Minas, and at this point a large wharf is being built. The traffic will be chiefly in coal; but some lumber is expected also. The road is equipped with one engine, one passenger, one baggage, 20 freight and 100 coal cars.

Niagara Suspension Bridge.

The engineers who have been engaged in the examination of the condition of this bridge have made a preliminary report to the directors of the Niagara Falls International and the Niagara Falls Suspension Bridge companies, the two companies which own the bridge. The report, which is signed by W. Milton Roberts, Chief Engineer of the Northern Pacific; T. E. Sickels, Chief Engineer of the Union Pacific, and W. H. Paine, Assistant Engineer of the East River Bridge, is as follows:

"Having been called upon by you to examine the Niagara Railway Suspension Bridge and to report upon its state and stability, we have the honor to report that we first examined carefully those portions of the bridge supposed to be defective, and find at the anchorages, where the strands are separated and pass to and from the shores, some of the outer wires somewhat corroded with rust, particularly at the first anchorage opened, where eight or ten wires were corroded quite through.

"This anchorage has been most thoroughly examined; all of the badly-rusted portions of the several wires have been removed until perfectly sound wires were found underneath. The portions removed have now been replaced by splicing a new piece to each individual wire under the strain due to the weight of the bridge.

"The state of the strands now at this anchorage and the general condition of the strands at the other anchorages lead us to the opinion that there is at none of them a diminution of strength from corrosion of half of one per cent., which is as little as might be expected in any iron bridge structure standing the length of time this has stood; and it is to be noted that the oxidation of the wires has not taken place in the main cables between the towers, but at the extreme shore ends near the shores, where the strain is less than it is elsewhere.

"Careful tests have proved to us conclusively that the wire has lost none of its original strength from the strain to which it has been subjected, and there is no reason for us to believe that the bridge is now less capable of carrying the usual trains or the test load which was at first imposed upon it.

"During our examinations we have carefully noted that the action of the bridge under passing loads is normal, and as the heaviest locomotives and trains of eight or more loaded freight cars during this period have been constantly using the bridge we have had excellent opportunities of observing their effect.

"A further report, accompanied with drawings, will be submitted at an early day, in which will be stated in detail the examinations that have been made, and the results of numerous tests of the strength of wire from the cables."

James River & Kanawha Canal.

The Governor of Virginia has vetoed the bill providing for the lease of the canal to Mason, Harmon, Sheahan & Co., and its extension to Clifton Forge. He intimates, however, his willingness to approve a measure providing for a railroad connection from the terminus of the canal to Clifton Forge.

Columbus, Chicago & Indiana Central.

The Trustees and Receivers give notice that they will pay on presentation to A. Iselin & Co., No. 48 Wall street, New York, coupons due Oct. 1, 1876, on Union & Logansport 7 per cent. bonds, and those due Jan. 1, 1877, on Indiana Central 10 per cent. bonds.

International & Great Northern.

The circular asking holders to fund two additional coupons on the first-mortgage bonds states the floating debt (exclusive of overdue coupons) at \$653,722. The assets consist of \$960,000 of the company's first-mortgage bonds; 8,600 shares in the Texas Land Company, whose whole capital stock is 10,000 shares and which owns 1,822,720 acres of land and 6,122 town lots; 3,073,280 acres of the International land grant; \$286,300 stock of the Galveston, Houston & Henderson, and \$103,100 town and county bonds. The total amount of first-mortgage bonds, including the \$960,000 held by the company, is \$8,908,000, on which the annual interest charge is \$581,560. The net earnings for 1876 were \$619,000.

New Jersey & New York.

A meeting of the bondholders was held in New York, March 30, at which the committee submitted the plan of reorganization the features of which we have heretofore noted. There was much opposition to the plan among holders of the second and consolidated bonds, who held that it favored the first-mortgage bonds too much. After considerable discussion it was voted to add three members to the committee and to refer the plan back for modification and amendment.

Denver Pacific.

Of the outstanding bonds of this company, \$2,457,000 in all, about \$2,000,000 are held in Holland. A meeting was held in Amsterdam, March 12, at which \$513,000 were represented. The discussion related principally to the connection of the company with the Kansas Pacific (which owns three-fourths of the stock) and to the reported endeavors of the Receivers of that road to pay the May coupons on the Denver Pacific bonds. The meeting resolved to appoint a committee to inquire into the company's affairs and to select a trustee in place of the late Mr. Thomson, and to request bondholders to give the committee the necessary authority. The committee as appointed consists of Messrs. J. L. Ten Have (a director of the Chicago & Northwestern), A. B. Jolles and A. C. Wertheim, all of Amsterdam.

St. Louis, Rock Island & Chicago.

Since this road was bought by the Chicago, Burlington & Quincy in October last it has been really operated by that company, but under a separate organization. On April 1, however, the Chicago, Burlington & Quincy took formal possession of the road under a lease, and it will hereafter be known as the St. Louis & Rock Island Division of that road, and will be worked as a part of its system of lines.

New London Northern.

and in that distance five bridges were carried away and several bad washes made, besides the loss of the bridge and depot at Stafford Springs. At that place, also, 16 freight cars, nearly all loaded, were carried away and wrecked. The road was blocked to traffic for nearly a week while temporary bridges were being put up.

St. Joseph & Pacific.

The stockholders of the St. Joseph & Pacific, successor to the Eastern Division, and the Kansas & Nebraska, successor to the Western Division of the former St. Joseph & Denver City Company, at special meetings held March 29 and 30, voted to ratify the agreement for the consolidation of the two companies as the St. Joseph & Pacific.

Southern Minnesota.

Holders of first mortgage (pink) bonds of this company are requested to present the coupons due Oct. 1, 1872, and April 1, 1877, at the Third National Bank, New York.

ANNUAL REPORTS.

Richmond & Danville.

This company owns a line from Richmond, Va., southwest to Danville, 140.5 miles, with four short freight and coal branches in and near Richmond, 8.7 miles in all, making 142.2 miles owned. It works under lease the Piedmont Railroad, which forms an extension of its line from Danville, Va., to Greensboro, N. C., 48.5 miles; this road it substantially owns, holding all the stock and paying interest on the bonds as rental. It also leases the North Carolina Railroad from Goldsboro, N. C., to Charlotte, 223 miles, and the Northwestern North Carolina, from Greensboro to Salem, 29 miles. The Piedmont Railroad is included in the Richmond & Danville in the statement of accounts. The latest report is for the year ending Sept. 30, 1876. The whole system forms a line from Richmond to Charlotte with branches from Greensboro to Goldsboro and from Greensboro to Salem.

The equipment consists of 62 engines; 18 first and 27 second-class passenger, 1 passenger and baggage, 11 mail and baggage and 12 express cars; 498 box and stock, 247 flat, 45 stone flat, 50 coal and 21 conductors' cars; 1 superintendents', 1 pay, 3 road carpenters' and 21 shanty cars. Of these, engines, 3 second-class passenger, 2 mail and baggage, 2 conductors' and 3 shanty cars are leased to the Atlanta & Richmond Air Line.

The general account at the close of the year was as follows:

Capital stock (\$26,810 per mile).....	\$4,000,000 00
Due State of Virginia on \$600,000 loan.....	500,486 00
Bonded debt (\$21,481 per mile).....	3,205,000 00
Floating debt.....	395,380 82
Unclaimed interest, balances of accounts, etc.....	206,689 54

Total (\$55,667 per mile).....

\$6,305,586 36

On the Virginia loan an annual payment of \$42,000 as interest and sinking fund is made. The company holds 1,336 shares of its own stock; \$1,490,700 Piedmont stock; \$26,100 Richmond, York River & Chesapeake stock; \$287,694.30 Northwestern North Carolina stock and bonds; \$6,407.71 Roanoke bonds, and \$68,000 South Carolina county bonds; these last having been received in settlement of claims on the Atlanta & Richmond Air Line. During the year \$202,000 general mortgage bonds were sold at 80; at the same time \$87,200 matured bonds and \$161,111.44 floating debt were paid off. The greater part of the remaining floating debt has been replaced at a much lower rate of interest.

The work done for the year is stated in the Auditor's tables as follows:

	Rich. & Dan.	North Car.	North- western N. C.	Total.
Train mileage, passenger.....	256,839	204,034	459,573	
" " mixed.....			24,468	24,468
" " freight.....	247,961	155,200	403,181	
" " service.....	92,026	75,876	167,901	
Total.....	595,545	435,110	24,468	1,055,128
Passengers carried.....	132,297	113,377	14,915	260,589
Passenger mileage.....	7,364,335	5,731,430	348,743	13,438,508
Tons express freight.....	1,866	2,054	111	4,021
Tonnage mileage express freight.....	287,302	229,602	5,542	522,446
Tons freight carried.....	227,681	100,149	7,997	335,797
Tonnage mileage.....	17,435,445	6,806,608	221,323	24,463,376
Average pass. train load, No. 248,937	28.80	28.09	14.25	
Average fr't train load, tons 70.31	43.86	9.05		
Earnings per train mile.....	\$1,8613	\$1,3705		
Expenses " " " 0.9090	0.8801			
Net " " " 0.8704	0.4904			
Average rate per ton per mile, through.....	2.72 cts.	2.22 cts.	10.74 cts.	
Average rate per ton per mile, local.....	4.06 "	5.49 "	11.49 "	
Average per passenger per mile, through.....			3.03 cts.	
Average per passenger per mile, local.....			4.11 "	

Passenger business was light for most of the year and for nearly half of it only one through passenger train was run. In September the Centennial travel began to be felt, and the through travel for that month was very heavy. The freight traffic on the Richmond & Danville showed a considerable increase, but there was a large falling off on the North Carolina road.

The earnings for the year were as follows:

	R. & D.	North Car.	North- western N. C.	Total.
Freight.....	\$599,618 05	\$233,066 23	\$23,926 03	\$846,610 31
Passengers.....	248,937 94	215,561 68	13,017 78	450,520 40
Mail, express, etc.	94,642 28	40,710 58	1,832 00	141,184 95
Total.....	\$937,198 27	\$492,739 49	\$38,775 90	\$1,468,313 66
Working exp's.....	498,965 93	316,437 61	19,245 90	834,549 44

	R. & D.	North Car.	North- western N. C.	Total.
Net earnings.....	\$498,232 34	\$175,901 88	\$19,530 00	\$635,664 22
Gross earn. per mile.....	4,740 51	2,207 80	1,337 10	3,265 10
Net earn. per mile.....	2,216 65	788 80	673 45	1,400 08
Per cent. of expenses.....	53.24	64.37	49.63	56.84

The result of the year is worked as follows:

	Total net earnings of roads worked.....	\$633,664 22
Interest on investments.....		28,459 87

	Total.....	\$662,124 09
Int. on Richmond & Danville floating debt.....	\$35,911 52	
" " funded debt.....	246,130 05	
" " Roanoke Valley bonds.....	930 00	
" " Northwestern North Carolina bonds.....	780 00	
Rental Piedmont R. R.	60,000 00	
" " North Carolina R. R.	260,000 00	
Balance of change of gauge, North Car. R. R.	1,090 75	598,842 32

Net balance.....

\$63,265 77

There was a very considerable falling off in the earnings of the North Carolina road, which was, however, almost met by a decrease in expenses. The Richmond & Danville had a slight decrease in earnings and a considerable one in expenses, with a resulting increase in net earnings of about 20 per cent. The general depression of business and the low rates on through traffic affected the road considerably, but the result of the year may be considered favorable.

During the year old accounts, now considered worthless or nearly so, to the amount of \$210,495.06 were charged to profit

and loss, the principal items being claims of \$150,596.11 against the Atlanta & Richmond Air Line, and \$53,280.26 against the Roanoke Valley. Discount on bonds sold, amounting to \$40,400, was charged to the same account.

During the year 1,991.8 tons of iron rails and 64,359 ties were laid on the Richmond & Danville, an unusual amount of ditching done and some improvements made in the Richmond station. There are still 80 miles of the old light rails in the track which need renewal soon. Arrangements have been made to lay some steel rails during the current year at points of greatest wear, and to do a good deal of ballasting. The North Carolina road has been kept in good condition; 507.37 tons new iron and 71,111 new ties were used in repairs.

The employees of the road are now and have been for most of the past year receiving their pay promptly, being paid as soon as the pay-rolls for the month can be collected.

The tables contained in the General Superintendent's and Auditor's reports are unusually full and give many interesting details of the traffic and business of the road, which are found in but few companies' reports.

Appended to the report is the report of the special investigating committee appointed at the annual meeting in 1875. The report is long, and goes over the later history of the company pretty thoroughly. The committee generally approve the present management, but regret the unfortunate entanglement with the Atlanta & Richmond Air Line. They recommend that no new arrangements or guarantees be undertaken by the board of directors without the approval of the stockholders, and that no more bonds be issued except to provide for outstanding liabilities or actual deficiencies of revenue.

Maine Central.

During the year ending Dec. 31, 1876, this company worked the following lines:

Portland, Me., by Augusta to Bangor.....	136.5
Cumberland Junction by Lewiston to Waterville.....	73.0
Brunswick to Lewiston.....	23.0
Brunswick to Bath.....	9.0
Brunswick to Leeds Junction to Farmington.....	47.0
Waterville to Skowhegan.....	19.0

Miles.

Total owned.....	307.5
Belfast & Moosehead Lake, leased, Belfast to Burnham.....	33.5
Newport & Dexter, leased, Newport to Dexter.....	14.0
	47.5

Miles.

Total worked.....	355.0
	355.0

There was no change from the preceding year. The system covers the best populated and most productive portion of Maine, reaching nearly all of its chief towns, and carries a very large part of the traffic of the State. It is equipped with 60 engines and 15 snow-plows; 57 passenger, 28 baggage and 4 postal cars; 777 box and stock, 556 flat and 14 caboose cars; 110 service cars.

The capital account at the close of the year was as follows:

Maine Central stock.....	\$3,020,120 00
Portland & Kennebec stock.....	63,600 00

Total stock (\$11,979 per mile).....

\$3,683,720 00

Bonded debt (\$25,052 per mile).....	7,703,584 27
Maine Central interest scrip.....	78,191 00
Notes payable.....	928,920 32
Sundry accounts and balances.....	45,502 81
Profit and loss balance.....	608,757 18

Total (\$42,435 per mile).....

\$13,048,876 58

During the year a large part of the interest scrip and Portland & Kennebec stock were exchanged for consolidated bonds.

The work done during the year was as follows:

	1876.	1875.	Inc. or Dec.	P. c.
Train mileage, passenger.....	534,446	532,226	Inc. ...	2,230 0.4
Train mileage, freight.....	391,718	404,545	Dec. ...	12,827 3.2
Train mileage, service.....	71,075	903,209	Dec. ...	7,406 2.4
Train mileage, switching.....	224,728			
Total.....	1,221,967	1,239,980	Dec. ...	18,013 1.5
Passengers carried.....	693,199	672,372	Inc. ...	20,827 3.1
Passenger mileage.....	25,206,476	25,690,863	Dec. ...	482,387

EMPLOYMENT.

[Advertisements of situations wanted or of officers or employees wanted will be inserted under this heading for two cents per word for the first publication and one cent per word for each subsequent insertion. Payment must be made in advance. Letters forwarded.]

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Mechanic; 5 years' experience on first-class roads; references furnished. Address "MASTER MECHANIC," *Railroad Gazette* office, New York.

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A RAILROAD ENGINEER AND PRACTICAL machinist, who understands all branches of Railroad business, who has had position as M. M. and Supt. on small roads, wishes engagement on a larger road. Address F. M., *Railroad Gazette* office.

WANTED—A SITUATION, AS MASTER Mechanic; have had practical experience as Division Foreman of Engines, Buildings and House Foreman and foreman of construction; have had charge of 200 miles of road; am a first-class machinist and locomotive engineer; would run an engine and take charge of Machinery Department on some new road for one pay, until business justified my staying in. References first-class. Address "Engineer," *Railroad Gazette*, New York.

A GENTLEMAN OF LITERARY AC-
quirements, well esteemed as a public writer, and of large and varied business experience, would be glad of some employment requiring capacity, industry and thorough integrity. Address WALTER, *Railroad Gazette* office.

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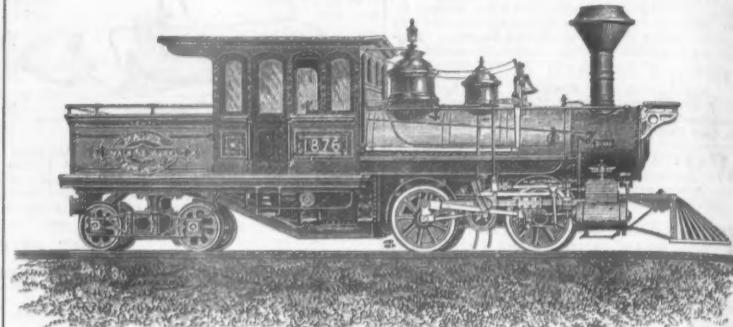
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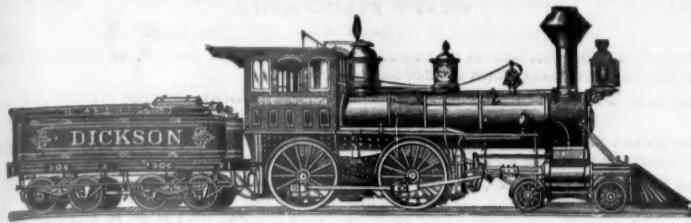
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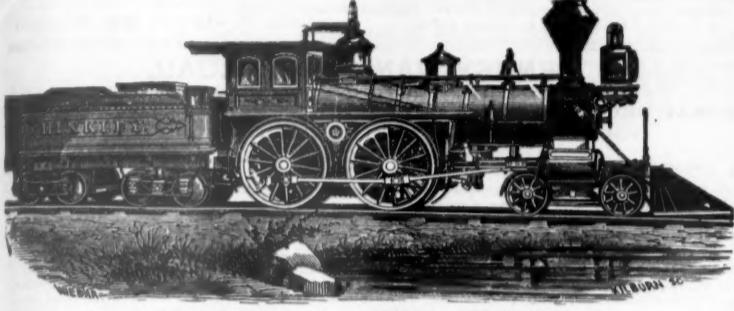
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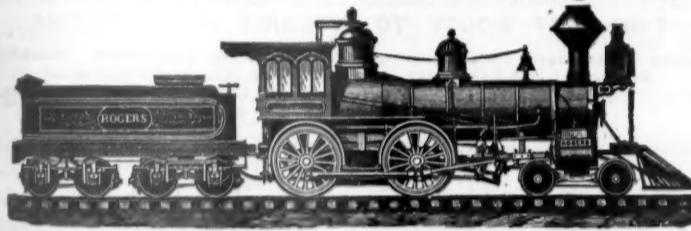
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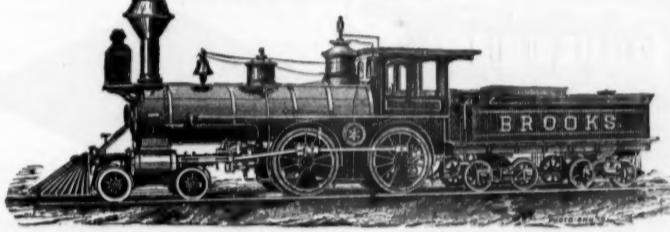


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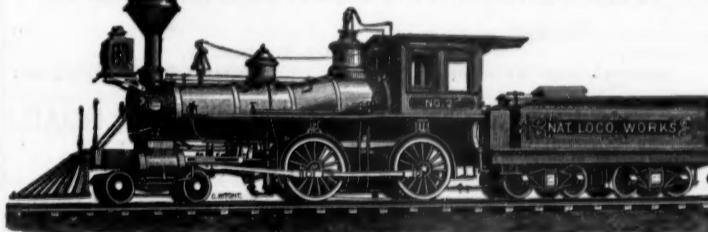
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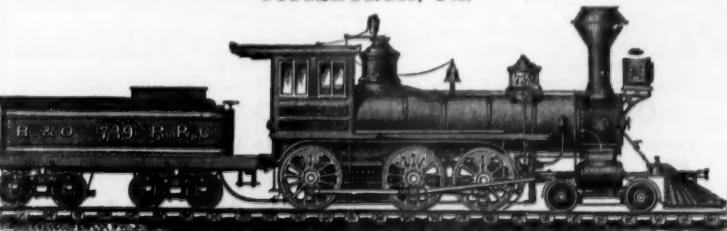
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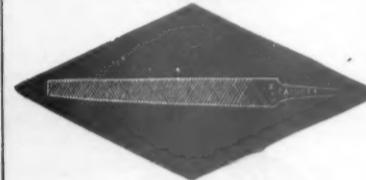
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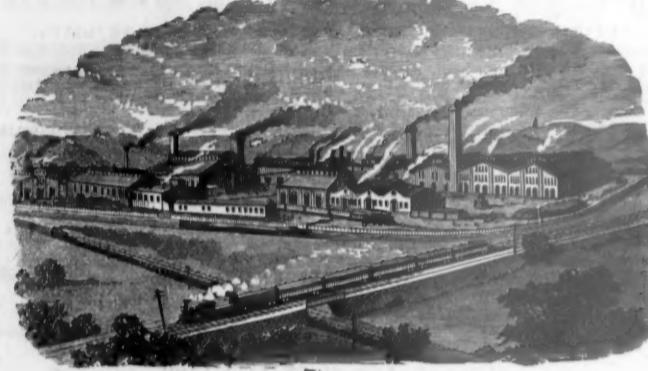
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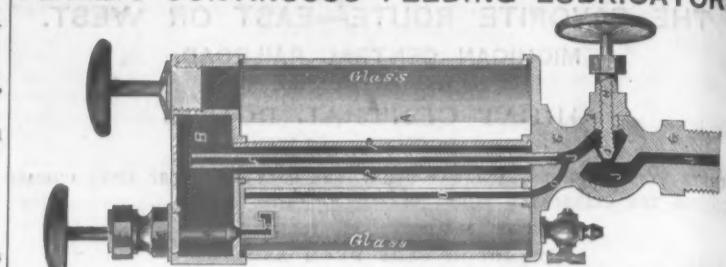
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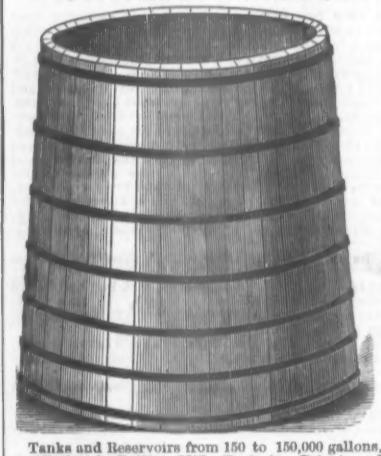
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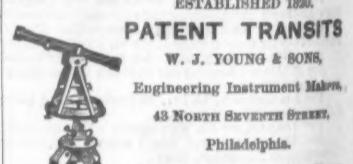
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